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INDUSTRIALIST.

A Weekly Newspaper, Published in the interest of the

KANSAS STATE AGRICULTURAL COLLEGE.

PRACTICE, WITH SCIENCE.

VOLUME FIVE.---APRIL 19, 1879,--JUNE 19, 1880.

MANHATTAN, KANSAS:
PUBLISHED BY THE PRINTING DEPARTMENT.
1880.

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THE INDUSTRIALIST

VOL. V. MANHATTAN, KANSAS, SATURDAY, APRIL 19, 1879. No. 1.

THE INDUSTRIALIST.

Published every Saturday by the
PRINTING DEPARTMENT
OF THE
KANSAS STATE AGRICULTURAL COLLEGE.

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Address A. A. STEWART, Manhattan, Kas.

Artichokes as a Field Crop.

I thought that the absurdity of growing artichokes as a field crop for profit had been exploded. Twenty-two years ago it had similar notoriety, and a furor not excelled by the growing of the *morus multicaulis*. I have no doubt that a great many of your readers will recollect both fevers; perhaps some to their cost. I once took charge of a place at Pittsburgh, Pa.; and my predecessor had planted seven acres of artichokes to feed hogs and to supply the market with it to feed the people. I can safely say that after digging, washing and preparing in the best manner to catch the eye, I never sold a bushel in market. I even gave them away to create a taste, but they would not bite, and we carted them back as we sent them. Has any one ever seen any of them in Washington, or other large markets? People are not fools to buy such stuff. I have tried them on cattle and pigs, and they will eat them, but you have all your labor for your pains. If you wish something to absorb dry meal, they will answer as well as red-top, strap-leaf turnips, but cost one hundred per cent more than turnips. I have fed them for six weeks, three times a day, to hogs, weighing the hogs before and after. At the same time I fed another lot on strap-leaf turnips, and on the turnips they gained a little; on Jerusalem artichokes, scarely any at all.

It took me five years to exterminate them from the ground, but by so doing, it made this, and the peach trees on it, the best trees and ground on the estate. I can eradicate five crops of Canada thistles easier than one of Jerusalem artichokes. Put them once into the ground, and rest assured they will eventually become the oldest inhabitant. I can recommend it to be grown by every dyspeptic individual, as twenty feet square of it will give him all the work he wants in trying to root it out. Farmers should avoid it as they would the plague. I am watching one lot planted on a rich piece of ground. I asked the owners why they planted it. They said they had seen it spoken of and recommended in the agricultural papers. I have grown a great many crops, but I have yet to attain a profitable result from nothing. The practical man, by one glance at an article, can tell whether it is practical.

"Disguise the matter as you will,"
Practice, practice, "is master still."
—*Correspondence Country Gentleman.*

Oats.

We have written about wheat, corn, sorghum, potatoes, and nearly everything else pertaining to the farm, but very little concerning oats, for the reason that many farmers have a mistaken notion that oats can't be raised here successfully. We find that the average of our crop for four years has been forty-two bushels per acre. No one will deny but that an average of forty bushels of oats is one of the best crops we can raise; and we propose here to give our manner of cultivating oats:

1. The ground must be old, having been cultivated at least three years previous to the sowing of this crop.

2. The ground must be clean, and free from weeds.

3. Oats do much better to follow corn. Three bushels per acre is not too much seed, though two and a half bushels does very well. If the ground is clean, they may be put in with a cultivator, but, on the whole, we prefer to plow the ground. If dry, as it is now, plow the oats in shallow; if wet, sow and harrow in thoroughly. Oats put in in this way are, in my estimation, as sure a crop as we can raise here.—*Osborne County Farmer.*

Boil it Down.

We have kept this motto in view since the commencement of the publishing of the *Agriculturist*, and have endeavored to boil down and condense practical agriculture into convenient shape for ready application. We make our articles short, because farmers of to-day are active business men, who make every moment count, and they nor we have any time to go into long details. Then, too, the average farmers have intelligent minds, and with their ready reasoning can get the merits in a nutshell. We like the following from the Baltimore *News:*

"The spirit of the age is for condensation, the lopping off of superfluities, a boiling down of the essence to a sort of solid extract, by distillation. The days of expansion, inflation and diffusion are passed, and compression has become, if not a necessity, a desideratum in the expression of our thoughts, whether they be from the pulpit, the rostrum, or the press. The man or woman who would gain the attention of the busy world, and impress a lesson, must teach briefly and pointedly. Humanity is restless—more so now than in the the past—in the pursuit of wealth and pleasure, and they have, or think they have, little time to spare. Hence, he who would impress them, must photograph his thoughts upon their minds with rapidity, and indelibly. Impressive brevity only can accomplish this. If it be lacking, failure is almost certain.—*Western Agriculturist.*

The Dry Weather.

Many of our people are grieviously alarmed about the continued dry weather. Old settlers do not think so much about it, but the new ones seem to fear fatal results.

There has been very little rain this spring in Northern Texas, the Indian Territory, Western Missouri, Colorado, Nebraska and Kansas. In fact, the country known as the "winter wheat belt" is suffering for rain. But for all that, there is no serious cause for alarm. Most of the winter wheat, not only in Kansas, but in other States adjacent, is suffering for the much-needed rain, while other fields in the same localities are getting along reasonably well.

It is not an uncommon thing for us to have a long dry spell in March and April. This is the rule, rather than the exception. The dry weather has hung on so long and so persistently that the wheat crop is seriously threatened.

But the dry weather has in no way threatened the corn and other crops. A dry spring is almost a sure indication of a good corn year. It is the months of July and August in which dry weather injures the corn. So, then, with the promise of a short wheat crop, our farmers ought to increase their acreage of other things. The rain will come with the greatest abundance plenty soon enough to make a good corn crop. In fact, we may confidently look for much more rain than will be wanted, at an early day, and we hope our farmers will profit from it.

It is no use to predict a dry summer, as that is an impossibility. We will have a splendid crop year, if it is not too wet. Mark the prediction.—*Walnut Valley Times.*

ARTICLES of agreement between the Kansas City, Lawrence & Galveston, the Kansas City & Santa Fe, and the Southern Kansas & Western railroad companies, have been filed with the Secretary of the State of Kansas, at Topeka. The new consolidated company is called the Kansas City, Lawrence & Southern Railroad Company. The capital stock is $2,940,000, divided into 29,400 shares.—*Lawrence Standard.*

ONLY seventy-five cents a year.

Our Exchanges.

An offensive war on weeds is five times less expensive than a defensive one.

It is said that over $60,000 worth of property has changed hands in this vicinity within the past three days.—*Wyandotte Gazette.*

There are twenty-two counties in Kansas that produce each more corn than is grown in the entire State of New Hampshire.—*Topeka Blade.*

During the past year the value of the butter and cheese produced in the United States amounted to $350,000,000. This is said to be one-seventh more than the wheat crop was worth for the same year.—*Emporia Ledger.*

The Kansas Pacific is hauling a great many mules to Denver, to be used in the business of freighting to Leadville from Webster. Wagon freight rates from Webster to Leadville amount to from $6.00 to $7.00 per hundred pounds.—*Lawrence Home Journal.*

The rain that has so long been looked for came on Saturday and Sunday last, followed by another storm on Tuesday night. Farmers now rest easy, and our business men all feel better. We have not had a good, old-fashioned rain before since October last.—*Seneca Courier.*

A disease is prevailing among horses in the neighborhood of Boonsboro, Md., which in some respects resembles the epizooty, but is more virulent, and very often proves fatal. The disease attacks the horse in the head and the throat. The throat beals, breaks, and in three or four weeks the disease runs its course, usually ending in the death of the animal. Mr. Silas Neikirk lost a very valuable horse by it; and others in the neighborhood have suffered by it. So far there seems to be no successful treatment for the disease.—*Chambersburg (Pa.) Valley Spirit.*

The Mississippi papers state that a fatal disease has broken out in the counties bordering on the Alabama line, which is pronounced by the physicians as "Black Measels," and by the negroes as the "Black Plague." It is represented to be very contagious and unusually fatal, not a single case having thus far recovered. The disease is also reported to be rapidly extending into Alabama; and the papers along the border demand that a commission of the most prominent and experienced physicians of both States be instantly appointed to examine into the character of this disease, and devise some means for checking it.

Every city in the country should adopt thorough sanitary measures and be prepared for the worst.—*Lawrence Standard.*

A Leak on Many Farms.

One leak on nearly every farm may be found in the neglect of the agricultural implements. In traveling over the country, it is no unusual sight to see ploughs, harrows, wagons, sleds, reapers and mowers, etc., piled in the fence corners, in the fields, lanes and barn-yards, and public highways. Whenever you see things piled around in this way, says the *American Rural Homes*, you can set it down that there is at least one leak on that farm. An excuse might be found for some farmers of limited means, that they are not able to build shelters for their implements; but we find the same leak on farms where they count their acres by the hundreds, and their dollars by the thousand. And of course the larger the farm the larger the leak. We believe a careful estimate of the annual shrinkage thus incurred by some farmers would astonish them, and show why farming does not pay.—*Exchange.*

THE INDUSTRIALIST.

SATURDAY, APRIL 19, 1879.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

THE sermon to the graduating class will be preached by Rev. A. C. Peck, of Lawrence, Sunday evening, May 18th. Col. W. W. Guthrie, of Atchison, will deliver the annual oration before the College, Wednesday evening, May 21st.

ATTENTION is directed to the advertisement of Short-horn cattle, the property of J. C. Stone, Jr., Leavenworth, Kan. In point of numbers and the quality of the offerings, this will without doubt prove the greatest sale ever held in Kansas. We have only one thought to offer here. Let every man mark the date, May 27th, and resolve to be present. We hope to see every animal of this herd retained within the State.

THE State Board of Education will hold an examination of candidates for State certificates and diplomas, at Lawrence, June 17th to 21st. The annual meeting of the State Teachers' Association occurs at Lawrence the same week. This is a wise arrangement, as it will enable those teachers who desire to obtain State certificates to avail themselves of the reduced rates always offered in connection with the meetings of the State Teachers' Association. By applying to his county superintendent, any teacher in the State can procure copies of the circular issued by Sup't Lemmon.

THE College acknowledges the receipt of the *American Chemical Journal*, Vol. 1, No. 1; edited by Prof. Ira Remsen, of the Johns Hopkins University, Baltimore. The first object of this new journal is to collect the best original papers written by American chemists, and to preserve them by publication in this form. Six numbers of the *Journal* will form a volume of from four to five hundred pages.

The *Journal* is intended to fill a place in the scientific literature of this country which is at present unoccupied, and we hope to be able to add it to our list of periodicals.

Commencement.

The Commencement exercises of the State Agricultural College will begin with the baccalaureate sermon, preached on Sunday evening, May 18th, and continue through Monday, Tuesday and Wednesday. An attractive programme will be made out in due time. The term examinations — both written and oral—will be continued through Monday and Tuesday. Let the parents and friends of students, and all interested in the work of the Agricultural College, be present at this annual gathering, and join teachers and students in this review of the labors of a busy and prosperous year. Manhattan people have long been noted for their hospitality; and we venture nothing in saying that its citizens will join heartily with the College authorities in being "at home" to all visitors.

The Tame Grasses.

Against the universal injunction to "plant trees," we have not one word to say. We only insist that there are other subjects, and notably the one named at the head of this article, equal to tree planting in importance, so far as the present or future welfare of Kansas is concerned. If we were inclined to be captious, many "odious" comparisons might be drawn. We might assert with perfect truthfulness that not even trees can give a greater charm to the landscape than fields of clover or blue-grass; and, if we add to this the fact that the grasses come to their maturity within two years from the seed, and in this State are nearly as permanent as the mightiest oak, and that they furnish abundant and nutritious food for nearly all classes of domestic animals, a strong case is certainly made out for the tame grasses.

But, let us both plant trees and sow grass seed. These two operations go hand in hand, and both are the necessary concomitants of civilization. Peoples without trees or meadows are everywhere nomads and barbarians, without associations of place, and knowing no higher motive than that of necessity. The civilization which is covering our western plains, as by magic, cannot and will not dispense with the sweet grasses. Let every one sow grass seeds according to his means; and, be his grass-fields small or large, they will always be the pleasantest and most profitable of his acres.—*E. M. S.*

Selecting Seed Corn.

At this season a large number, perhaps the majority, of farmers select their seed corn. This is not the best plan by any means, although we greatly prefer it to the common method of selecting seed at the time of husking. At that busy time the farmer is unable to examine the corn carefully, to see whether it comes up to his standard, and should there be more than one husker, each selects what in his judgment is the best, and the result is a mixed lot of seed corn, and rarely the best ears. The best time in which to collect seed corn is immediately after husking, making the selection directly from the crib or largest bulk of ears; and, especially, let all the work be done by one person, and this person, I hardly need say, should be the proprietor. A few general rules should govern the selection of seed corn, whenever it is made, and whatever sort is used.

In the first place, every corn-raiser should have in his mind's eye what is the best kind of corn for his soil, climate and surroundings. His estimate should not merely include the small or large sorts, but such details as color of grain, size of ear, number of rows to the ear, and color of cob. In gathering seed, only those should be used which come the nearest to this standard. We should as soon expect to get the best beef stock by breeding indiscriminately Short-horns, Texans and Jerseys as that good corn would be obtained from planting all sorts of corn in the same field. Our experience on the College farm seems to show that ears having a medium number of rows of corn are the most productive, and that the variation in the weight of the cob is so very slight as practically to amount to nothing.—*E. M. S.*

IN the Burlington *Patriot* of last week, Mr. C. A. Dow, an old student of the College, gives forcible expression to some sensible ideas on the vexed subject of pork-making. Under the heading, "Does it Pay to Feed Hogs," he says:

"This question is often asked by farmers, and to them it is surely one of great importance. The answer depends entirely upon what kind of hogs are fed. It certainly does not pay to feed inferior stock, or any breed that has to be fed two or three years before they are fit for market. At the present low price of hogs, there cannot be any profit in feeding the common hazel-splitters, and very little in feeding the large-boned breeds, such as Magee and Poland: they are gross eaters and require too long to come to maturity. It is with the small or finer-boned breeds that the large profits are made. They put on more flesh with a less quantity of food than the larger breeds, and are ready for market from twelve to fifteen months old, while the big-boned scarcely begin to fatten till they are two years old. Of the small breeds, the Berkshire undoubtedly stand at the head of the list. They are easy feeders, will fatten at any age, and readily make three-hundred-pound hogs at a year old. They command a higher price in the eastern markets, and buyers here prefer them to any other breed. They are less liable to disease, and are not so much affected by mange as white hogs. These are facts acknowledged by all stock men, and are of great importance to the general farmers. Every one should strive to improve his stock, and now while prices are down is the time to do it. Get the best; for, although they cost more in the beginning, they are cheaper at the end, and an inferior animal is dear at any price. It costs more to keep a poor animal than a good one, and will not bring as much when sold."

The Live Stock of the State.

From the valuable report of the Kansas State Board of Agriculture, we find the number of horses owned in the State in 1878 amounted to 586,000; sheep, 243,760; swine, 1,195,000; mules and asses, 40,564; milch cows, 286,241.

In sheep and mules, there would seem to be a wide and profitable field unoccupied. Mutton sheep would seem to be especially profitable, the price of mutton in the markets of the State ranging from 2½ to 3 cents higher than choice cuts of beef. The mutton produced on the high, dry prairies of Kansas is remarkable for its mild, fine flavor, as far as we have been able to experiment by actual test with mutton chops, singularly free from the *sheepy* taste found in a great deal of mutton, and which is so objectionable to most tastes. While the fine-wooled sheep take the lead at present, and very reasonably so, breeding mainly for wool having been the custom heretofore on the plains and in the far West, we believe that the time has arrived when the heavy mutton breeds would prove the most profitable. A fine lot of fat wethers will always command a handsome price, and at two years old Cotswold wethers could be made to weigh two hundred and fifty pounds gross, with a fleece that would average twelve pounds of most salable wool. There is an active and increasing home demand for good mutton in all the towns of the State, and in the cities East and West, while the demand for lambs fit for the shambles in June and July far outruns the supply.

The demand for large mules is always brisk, and there is no class of stock raised on the farm which will command the sum of money at one year old that a good mule will, while they are easily and cheaply raised.

While the rage for wheat-raising, with all its vicissitudes, absorbs the attention of all classes, and immense areas of corn tax the labor of the State to produce these bulky products, whose transportation to market costs very nearly all they will sell for above cost of production, the two classes of live stock, requiring not one-fourth the labor and expense to produce, are comparatively neglected. With millions of acres of fine, nutritious grasses growing without care or labor from man, it is passing strange that the chief aim of every farmer is not directed to utilizing this wild, spontaneous wealth. But such is the force of habit that men will invest enough capital in costly farm machinery to purchase a fair herd of animals, and incur heavy expense in labor and money in turning under hundreds of square miles of green herbage, already provided by nature without cost to man for the support of flocks and herds.

In 1878 there was raised in the State of Kansas nearly thirty-three million bushels of wheat, and ninety million bushels of corn. Had half the labor and expense been invested in sheep and other stock, does any one doubt that the profit would be fourfold? The markets cannot be gluttoned with draft animals, and a superior quality of mutton sheep and combing wools.

The fine pasture fields of Kansas are being ruthlessly destroyed to raise grain, which every farmer you meet will acknowledge costs nearly if not quite all it is worth, over and above cost of raising, to get it to market! If the feeding grounds were sown with blue-grass seed, when the stock have eaten the grass close, in a short time a blue-grass sod as fine as any in Kentucky would replace the wild grasses, creating, eventually, pasture fields whose value in dollars it would be impossible to estimate. It has been demonstrated by actual trial, that a man may, by pursuing a systematic course, convert his range into a blue-grass sod without breaking a foot of it with the plow.—*Kansas Farmer.*

THE INDUSTRIALIST.

SATURDAY, APRIL 19, 1879.

The new cut of the College buildings will appear next week.

One month more and another school year will have ended.

Lettuce, pie-plant and radishes appear in the market in abundance.

Prof. Shelton went to Leavenworth last Thursday, and will probably return this evening.

The Alpha Beta Society postponed its regular session yesterday afternoon, an account of the funeral of Mrs. Buell.

At the last Faculty meeting it was decided that an under-graduates' exhibition shall be given during the coming Commencement.

Prof. Failyer reports for the rain of Sunday eve a total down-pour of .68 inches, and for Monday morning .22;—a total rain-fal of .9 inches.

That wretched, old red cow which has tormented everybody connected with this institution, has been taken up by Mr. Morgan and posted as a stray.

The semi-annual meeting of the Kaw Valley Musical Association will be held in Manhattan next month, beginning Tuesday, May 27th, and closing Friday evening, May 30th.

Prof. VanDeman is engaged with a squad of students in beautifying the College lawns. He is setting out trees, laying walks, and making flower-beds. Let the good work go on!

The Printing Department acknowledges the receipt of the last number of the *Typographic Advertiser*, Philadelphia, and the April issue of the *Quadrat*, Pittsburgh. These are excelleut typographic journals.

Prof. D. C. Crosby, Professor of Natural History in the Kansas City High School, viewed the workings of our industrial College on Wednesday. The Professor expressed himself as much pleased with what he saw and heard.

Prof. and Mrs. Platt went to Wabaunsee yesterday to attend the silver wedding of Rev. Mr. Jones, one of the earliest settlers of the county. We understand a fine water pitcher and goblets are among the principal presents.

On account of business engagements or pressing home duties, several of our students have been compelled to drop out of their classes. We are sorry to lose them, but hope they will be able to return at the opening of the fall term.

Mr. E. J. Nugent, of Ottawa, Kansas, has lately sent to the Horticultural Department, for trial, a few trees of two of his finest seedling peaches. One of them, called "Nugent's June," was shown at the meeting of the Kansas State Horticultural Society at Garnett, last June, and the specimens there seen were very good indeed. They were fully ripe by June 15th, last year. We hope to add many such things to the experimental orchard of the College.

The College has lately received from the Department of the Interior several valuable works. Among the most important are the following: "Birds of the Colorado Valley," by Coues; "The North American Rodentia," by Coues & Allen; "The Geometrid Moths," by A. S. Packard; "Report of Entomological Commission;" "Explorations of the Colorado River;" "Geology of the Uintah Mountains." In addition to the above, there are several minor reports, all of which will be of great use to the professor who shall develop the department of natural history in the Kansas State Agricultural College.

Mrs. Harriet A. Buell, mother of C. Stewart and Delight Buell, two of our students, died quite suddenly on Tuesday, the 15th inst. The funeral services were held at the Congregational Church, of which the deceased was a member, yesterday afternoon. The Faculty and students deeply sympathize with these two friends, as well as their brother George, in this great bereavement. About a year ago the father of these parties was taken away, and now they have been called to give up the dearest and most faithful friend on earth,—a mother. We trust that in their sad affliction they may be sustained by Him who has promised to bind up the broken-hearted, and give peace to the sorrowing.

That the Webster Society is still alive was very plainly shown last Saturday evening, when the report of the committee on books was read. It was conceded by all to be the "hottest" time the Society has seen since the days of "January." The question as to the comparative value of traveling and reading, for the improvement of one's mind, was decided in the negative. Mr. J. F. Stevens was elected a member of the Society. Mr. Richardson presented the *Reporter* in a manner which showed that the shears had not been employed in the "make-up" of the paper, and also that the editor has original views on the important topics of the day. Owing to the extra amount of labor required of some of the students, for the under-graduates' exhibition, the joint session has been abandoned. The Society will discuss the following question at its next meeting: "*Resolved*, That a nation does of necessity have a rise, decay and fall." Affirmative, Buell and Leach; negative, Marvin and Todd. Declamation, J. N. Morrow; select reading, W. I. Light.

LEACH.

WHEAT PROSPECTS.

The last two weeks of the dry weather have very injuriously affected the wheat crop on the College farm. In general, all the weaker plants, or those which from any cause have been unable to send their roots to great depths, have either perished outright, or are so much weakened that little can be expected from them in the way of a crop. As nearly all of our wheat was sown upon well-prepared summer-fallow, and all was sown early in the season, it is reasonable to suppose that the injury sustained has been much less than upon fields less carefully put in.

Arnold's Gold Medal has suffered very severely. Apparently quite one-half of all the plants have perished, and the remainder are very feeble.

Golden Straw has suffered somewhat less than the Gold Medal, but it gives abundant evidence of having suffered seriously.

Fultz.—This favorite sort has seemingly sustained about the same injury as the Golden Straw.

Silver Chaff.—This variety we have not hesitated to pronounce one of the best of the new sorts of winter wheat for Kansas, basing our judgment solely upon its performance last season, and its general habit of growth. It has suffered much less than either of the above, but more than the Early May variety.

Early May has been injured more or less severely, but much less than either of the above. We judge that, with favorable weather from this time till harvest, much more than two-thirds of a crop will be made.

New sorts may rise and many will fall;
The old Red May survives them all.

NATIONALIST ITEMS.

Adams, Kearns and Haskins shipped thirteen cars of fine stock on Tuesday.

An elegant train of palace cars went West on Tuesday,—mostly railroad officials.

According to the Atchison *Champion* there is to be a reunion of Andersonville prisoners residing in Kansas.

After the first of May, there will be a daily mail up the Blue river, which will be a great convenience to the people along that line.

Purcell & Anderson will have, within a week, a telephone from the St. George elevator to the elevator in town, and connect also with Mr. Purcell's store, bank, office, etc.

Rev. F. T. Ingalls, of Atchison, will lecture on "Leadership" in the Congregational Church, Thursday evening, April 24th. Admittance, 25 cents; students, 15 cents.

The County Treasurer has moved his office in with the County Clerk, and the Register of Deeds and Probate Judge have moved their office into the room vacated by the Treasurer.

The waiting-room of the depot at Manhattan needs enlarging and improving. It is now so often crowded, and filled with tobacco smoke, dirt and stench, as to be almost unendurable.

An axle broke on one of the cars of the freight West on Sunday morning, throwing five or six cars from the track east of town. The express East was delayed at this point only a few hours.

The Christian Church has been undergoing a complete renovating in ceiling, papering, painting, etc., and is to have a new set of seats put in next week; and, when painted outside, with its new steps, will be a great improvement.

The plank walk from the ravine to the depot is in a disgracefully dilapidated condition. It was put down by the city, but as it is on railroad land the authorities think the company ought to keep it in repair, and they are certainly correct.

The rains of the past few weeks, with the heavy snows of winter, had prepared the ground to take in the regular deluge that came last Sunday night and Monday forenoon. We have not a forward spring, but everything is looking as well as we have ever seen it; and, if nothing befalls us in this vicinity, we shall have a good crop of fruit and a bountiful harvest.

On Thursday night of last week the new city council organized,—all the members present,—and Judge Blain was elected President. The following officers were nominated and elected: Treasurer, A. J. Whitford; Clerk, M. B. Ward; City Attorney, R. B. Spilman; Marshal, L. C. Stone; Street Commissioner, Jerry Haines. The terms of the officers commence on the first of May.

DIRECTIONS TO APPLICANTS.

TERMS OF ADMISSION.

Candidates for admission must be fourteen years of age, and pass a satisfactory examination in reading; arithmetic, through decimal fractions; and English grammar, to syntax. Classes are started at the beginning of each year in Drill in Arithmetic and Drill in English; and the pupil must have the knowledge above indicated, else he will be unable to retain position if admitted.

Pupils will be received at any time during the year, if able to pass an additional examination upon the subjects studied by the classes which they expect to enter. But they will find it greatly to their advantage to be present at the opening of each term, or as soon thereafter as posssble.

GRADES.

Both the Literary and Industrial recitations are graded daily upon a scale of 100; and an examination of all classes is made at the close of each month. A student not attaining an average grade of sixty is promptly dropped to a lower class, or excluded from the Institution until able to do so. The work of grading is strict and uniform in all the departments, and this process is rigorously used for sifting out incompetent and indolent pupils; thus more than accomplishing all that is designed to be effected by a "high standard of admission." Hence, the student's continuance in the College wholly depends upon his own action.

The course is based upon the determination to make the labor required in the preparation of one industrial and three literary recitations as much as the average student can perfectly perform, in ten hours a day. We design to give the pupil the worth of the time expended at College; and, in order thereto, he must do a full day's work with brain or hand. Only those students who can maintain a standing of ninety in each study will be allowed to take more than the prescribed number of recitations; and no one will be permitted to have less than one industrial and three literary recitations.

RELIGIOUS.

Unless otherwise directed by parents, students are required to attend chapel at 8:30 A. M. on academic days, and divine service once every Sabbath.

EXPENSES.

There are no charges whatever for enrollment, attendance or instruction in the regular courses; nor are there any "contingent fees" for the repair of buildings, for the use of books or apparatus, for diplomas, or the kindred privileges usually grouped under the term "contingent." Male students are furnished instruction, the use of apparatus, instruments or tools, in both the literary and industrial classes marked out for them, without any charge. And the same is true of female students in the regular classes provided for them. Printing and Telegraphy are industrials primarily provided for the education of female students, and male students taking either of these are charged $1 per month for use of instruments.

Instrumental music is a fine art or "accomplishment," rather than a mechanical art. We do not place it among our "industrials" in the same sense, or for the same purpose, that we do those provided for teaching the trades. Accordingly, a fee of $12 per term, or seventy-five cents per week is required from female students for tuition and the use of pianos or organs.

The only charge made for material in either the literary or industrial departments is for the chemicals used by students in laboratory practice, which are furnished at wholesale prices, and amount to but a small sum.

Furnishing an absolutely free education is as much as can be reasonably asked; and the Institution neither boards, clothes, nor supplies the student with text-books. Boarding can be obtained in private families at from $2.75 to $4 per week. Washing costs from seventy-five cents to one dollar per dozen. Text-books, which can be procured in Manhattan, cost from $2 to $5 per term.

No student need expend over $5 per week; and many of our best pupils are living at $1.25 per week. Students desiring to "board themselves" can do so at from $1 to $2 per week. In a club of four young men, renting a house, the average cost to each for the term was $1.11 per week.

LABOR.

Manual labor by the students may be for either of two purposes: First, to acquire skill in a given art; second, to earn money. In the first case, the labor is educational; in the second, it should be paid for by the party benefited.

Educational Labor.—Manual labor in the reciations of the Industrial Departments, like mental labor in those of the Literary Departments, is purely educational and will not be remunerated. While the interest of the student will be held paramount in the direction of this labor, the practice necessary to dexterity will be required.

Remunerated Labor.—When the Institution needs labor on the Farm or elsewhere which is not educational, but simply for its own profit, and which a student is able and willing to perform, it becomes an employer instead of a teacher, and he an employe instead of a scholar. It pays for work, he works for pay. The relation between them is commercial, not educational; and both parties must act upon business principles. Hence, the College furnishes only such employment as its own interests require, and will pay according to the value of the service rendered at from seven to ten cents an hour.

AMOUNT EARNED.

It is impossible to predict how much a given person can earn, since that depends upon what he can do and what work there is to be done. Hence, it is wholly impossible for us to answer the question so often asked: "Do you think I can meet my expenses by work?" Some students make one-half their expenses, some the whole, and exceptional men have made more than expenses. As a rule, a faithful boy skilled in farm work can earn half his expenses on the Farm or in the Nursery. During the year he can ordinarily acquire sufficient skill in the wood or iron shops to enable him to make articles for sale. The whole question is one for his own consideration and decision. We can teach all who come, but cannot absolutely *promise* anything more. Hitherto we have refrained from holding out strong inducements respecting the amount of labor we might have to offer; but in view of the fact that during each of the last three years we have had more to do than the students could perform, we are inclined to give greater and positive encouragement on this point. Any boy who is in dead earnest, who is familiar with farm operations, and who can raise $50 to start with, should be able to carry himself through the four years' course. And certainly this places an education within the reach of every determined boy. As yet we are unable to offer similar advantages to girls, not requiring labor in the College departments which they can perform.

RULES.

1. Behave as a true man or woman should, at all times and in all places.

2. Attend to your own business promptly, thoroughly and courteously; and vigorously let alone that of other people.

3. Penalty: "Leave!"

PUBLICATIONS.

The "Hand-Book," published in 1874, containing a full discussion of the educational question and the aims of the Institution, will be forwarded to any one desiring it.

THE INDUSTRIALIST, a weekly journal edited by the Faculty and published by the Printing Department, contains original and seasonable articles on the Farm, Orchard, Trades, Sciences, and Education. Price, 75 cents a year. Address A. A. Stewart, Manhattan.

CALENDAR.

Winter Term 1879.—Began Friday, January 3d, 1879.

TO NEW STUDENTS.

Bring the text-books you have been using. On arrival, first arrange for your boarding. A. A. Stewart, Sup't Printing Department, will furnish information, either by letter or on application, concerning boarding places or rooms for rent. Report to the President at 8:30 A. M., immediately after chapel, for enrollment.

For further information apply to Jno. A. Anderson, President, Manhattan, Kansas.

LITERARY SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in College building every Friday at 2 P. M. Ladies admitted. New students cordially invited to attend. GEORGE PERRY, President.
MISS GRACE PARKER, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Telegraph Hall every Saturday evening. Visitors, especially students, always welcome.
C. E. WOOD, President.
C. M. SHARTEL, Secretary.

RAILROAD TIME-TABLE.

KANSAS PACIFIC RAILWAY.

PASSENGER ARRIVES.

No. 2, going East	11:14 A. M.
No. 4, going East	3:47 A. M.
No. 1, going West	5:10 P. M.
No. 3, going West	4:33 A. M.
No. 7 (freight), going West	8:15 A. M.

Nos. 1 and 2 run daily; Nos. 3 and 7 run daily except Monday; No. 4 runs daily except Sunday. Passengers with tickets are carried on No. 7.

GEO. C. WILDER, Agent.

THE INDUSTRIALIST.

SATURDAY, APRIL 19, 1879.

INDUSTRIAL EDUCATION.

The real value of an education to the student depends upon two things: First, the practical worth of the knowledge taught; and, second, the degree in which he makes it his own. Hence, the ability of any institution to give a practical education depends upon the kind and aim of the knowledge it teaches, and upon the thoroughness of the instruction therein. The State Agricultural College was directly endowed by Congress, and is guided by the State, for the specific purpose of furnishing to the industrial classes of Kansas a "practical" education, that is, "one fit for use." As its name indicates, and as the statistics of the industries of the State require, its chief work must be that of giving a useful and usable education to those who will engage in farming; and, therefore, the Farmer's Course must, from the nature of the case, be its main one.

FARMER'S EDUCATION.

Words and figures are merely instruments with which to record ideas. They are not themselves ideas, nor should they be made the chief end of an education. As a wagon is necessary to haul grain, so are they a necessary part of an education; but as the wagon is not the grain, so they are not the knowledge which the farmer converts into money. Hence, the classics and higher mathematics are not taught. But it will be noticed in the following course that so soon as the pupil acquires working skill in the use of the English language as a tool, and of figures and lines as mathematical tools, those arts and sciences which present knowledge that has a cash value to the farmer are taught as rapidly as their importance and thorough acquisition will permit. Studies numbered (1) and (4) in the second, third and fourth years are the spine of the course, to which the others are as ribs and muscle.

FARMER'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Practical Agriculture (advanced.)	1. Farm Economy, Special Hygiene.	1. Botany, Entomology.	1. Physiology.	1. Physiology.	1. Drill in English.	1. Drill in English.	1. Drill in English.
2. Geology, Mineralogy.	2. Geology, Mineralogy.	2. Inorganic Chemistry.	2. Rhetoric.	2. Rhetoric.	2. Drill in Arithmetic.	2. Drill in Arithmetic.	2. Drill in Arithmetic.
3. Polit. Economy, Practical Law.	3. Polit. Economy, Practical Law.	3. Practical Geometry.	3. Algebra.	3. Algebra.	3. Industrial Drawing.	3. Industrial Drawing.	3. Industrial Drawing.
4. Zoology.	4. Zoology.	4. Horticul., Landscape Gardening.	4. English Literature.	4. Practical Agricul. (elementary).	4. English Structure.	4. English Structure.	4. English Structure.
5. Agricul. Chemistry Meteorology.	5. Phys'l Geography, Meteorology.	5. Organic, Analytical Chemistry.	5. Physics.	5. Physics.	5. Adv'd Arithmetic, Book-keeping.	5. Adv'd Arithmetic, Book-keeping.	5. Adv'd Arith., Book-keeping.
6. Logic.	6. Logic.	6. Practical Surveying.	6. Industrial Drawing.	6. Industrial Drawing.	6. U.S. History, Industrial Drawing.	6. U.S. History, Industrial Drawing.	6. U.S. History, Industrial Drawing.

WOMAN'S EDUCATION.

Nearly one-half of our students are females, and the Woman's Course is prepared expressly for their liberal and practical education. We have no doubt whatever that practical men and women, who understand what it means and what it seeks to do, will fully endorse it.

WOMAN'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Farm Economy, Special Hygiene.	1. Farm Economy, Special Hygiene.	1. Botany, Entomology.	1. Physiology.	1. Physiology.	1. Drill in English.	1. Drill in English.	1. Drill in English.
2. Geology, Mineralogy.	2. Geology, Mineralogy.	2. Inorganic Chemistry.	2. Rhetoric.	2. Rhetoric.	2. Drill in Arithmetic.	2. Drill in Arithmetic.	2. Drill in Arithmetic.
3. Polit. Economy, Practical Law.	3. Polit. Economy, Practical Law.	3. Industrial Drawing.	3. Algebra.	3. Algebra.	3. Industrial Drawing.	3. Industrial Drawing.	3. Industrial Drawing.
4. Zoology.	4. Zoology.	4. Horticul., Landscape Gardening.	4. English Literature.	4. English Literature.	4. English Structure.	4. English Structure.	4. English Structure.
5. Phys'l Geography, Meteorology.	5. Phys'l Geography, Meteorology.	5. Organic, Household Chemistry.	5. Physics.	5. Physics.	5. Adv'd Arith., Book-keeping.	5. Adv'd Arith., Book-keeping.	5. Adv'd Arith., Book-keeping.
6. Logic.	6. Logic.	6. Household Economy.	6. Industrial Drawing.	6. Industrial Drawing.	6. U.S. History, Industrial Drawing.	6. U.S. History, Industrial Drawing.	6. U.S. History, Industrial Drawing.

MECHANIC'S EDUCATION.

Because of the adaptedness of the leading course to the wants of the intelligent mechanic, it has been found practically unnecessary to diverge from the Farmer's Course. Additional studies, specially adapted to the mechanic's use, will be furnished in a Post-Graduate's Course.

If it be urged that the distinctively agricultural knowledge taught in the Farmer's Course is not directly valuable to the mechanic, we reply that, admitting the point for the purpose of argument, yet: 1. This knowledge is of more practical value to the mechanic than is the Latin, Greek, or a half dozen other things embraced in the usual course preparatory to the professions; 2. That the great majority of Kansas mechanics will also be more or less engaged in agriculture; 3. That those studies in the course which are directly valuable to the mechanic, together with the shop facilities, offer a better mechanic's education than can be elsewhere found west of the Alleghanies.

INDUSTRIAL DEPARTMENTS.

Having knowledge in the head is one thing; ability to use it with the tongue, fingers or feet is quite another thing. Both are vital to success in practical life. A man might thoroughly understand the theoretical principles of carpentry, and yet, not having used the tools, be wholly unable to earn carpenter's wages. So in all other vocations. Accordingly, instruction is given in the following well-equipped Industrial Departments, and every student is required to recite in some one of them, as selected by the pupil or parent:

FOR MALE STUDENTS.	FOR FEMALE STUDENTS.
The Farm.	**Dress-making.**
The Nursery.	**Printing.**
Carpentry.	**Telegraphy.**
Cabinet-making.	**Scroll-sawing.**
Turning.	**Carving.**
Wagon-making.	**Engraving.**
Painting.	**Photography.**
Blacksmithing.	**Instrumental Music.**

Each of these departments is conducted exactly as in daily life, and aims to give precisely the drill received by an apprentice. No charge is made, either for tuition or material, from male students taking the Industrials provided for them; nor from female students taking the ones provided for them, except in the Department of Instrumental Music. Male students taking either Printing or Telegraphy are charged $1 per month for the use of material and instruments.

DEPARTMENTS OF INSTRUCTION.

DEPARTMENT OF AGRICULTURE.

PRACTICAL AGRICULTURE.

Second Year:—General principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage.

Fourth Year: General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of a rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farm-houses; barns.

FARM ECONOMY.

Woman's Course, Fourth Year: Dairy products as human food; influences affecting character of milk; manufacture of condensed milk; the factory system and household plan of cheese-making; treatment of rennet; general process of cheese manufacture; subsequent treatment of cheese; butter-making; creameries; "deep" and "shallow" setting systems; general process of butter-making; packing and preserving butter.

DEPARTMENT OF BOTANY AND PRACTICAL HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest; also a course of lectures on Landscape Gardening. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard; fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture; shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in in the work of laying out and plotting grounds topographically.

CHEMICAL DEPARTMENT.

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life. Text-book, Ganot.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blow-pipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

Are constantly in progress in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

DRILL IN ENGLISH.

"As grammar was made after language, so ought it to be taught after language."—*Herbert Spencer.*

Drill in English embraces the following topics:

Sounds of the language; drill in producing the vocal, sub-vocal and aspirate elements with accuracy, distinctness and volume; vowels, consonants.

Letters: Form; power; rules for spelling, drill.

Words: Signification, properties, modifications, variations, relation and dependence.

Sentences: Drill in statement of ideas; description, clearness, terseness, vigor; business letters, discussion; capitalization; syllabication; punctuation; construction and analysis of sentences; elements, uses and names; criticism of compositions printed as written; proof reading; grammatical construction; superfluous words and clauses; drill in reading, speaking and penmanship.

Text-books: Webster's Academic Dictionary; Lee & Hadley's Advanced Lessons in Language.

Pupils deficient in spelling, etc., should enter the printing class, the printing-office being the work-shop of language.

STRUCTURE OF ENGLISH.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

MATHEMATICAL DEPARTMENT.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

DRILL IN ARITHMETIC.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Following this line, the student, so far from hammering away at "pure" science draws from the mathematical store-house what he needs, and sees why he needs it. Accuracy of calculation and posting, rather than a *mere* comprehension of the principles, is aimed at. Besides the recitation-room drill in business forms, practice in the field is also given. Estimating the number of cords in a pile of wood said to be 100x4x4 feet is one thing; measuring a pile of wood through which any number of cats may be harmlessly thrown, and in which four-feet sticks are the exception, is quite another and more difficult thing.

ARITHMETIC AND BOOK-KEEPING

Is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides ensuring arithmetical practice, develops practical skill in that important art.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admiral system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study. In addition, constant practice in the application of lines to metal and wood is furnished in the Blacksmith, Carpenter, Turning, Scroll-sawing, Carving, Engraving and Printing shops, and to fabrics in the Sewing Department.

PRACTICAL GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the use of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

PRACTICAL SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodlite.

STUDIES SPECIAL TO WOMAN.

Besides the studies already indicated, attention is called to the following:

SPECIAL HYGIENE.

As shown in the course, one term is devoted to the study of Physiology, from the text-book of Dr. J. C. Dalton. This is followed in the fourth year by a course of lectures to young ladies by Mrs. Cripps on the subject of Hygiene, embracing such instruction in hygienic matters as are valuable to woman.

FARM ECONOMY considers those affairs of the farm which usually come under the supervision of the farmer's wife or daughter, and which are not included in "gardening" or "household economy;" such as butter and cheese-making, dairy management, etc. A course of lectures is delivered by the Professor of Practical Agriculture. See heading, "Farm Economy."

GARDENING is included in Practical Horticulture. See heading, "Landscape Gardening."

HOUSEHOLD CHEMISTRY. See heading, "Household Chemistry."

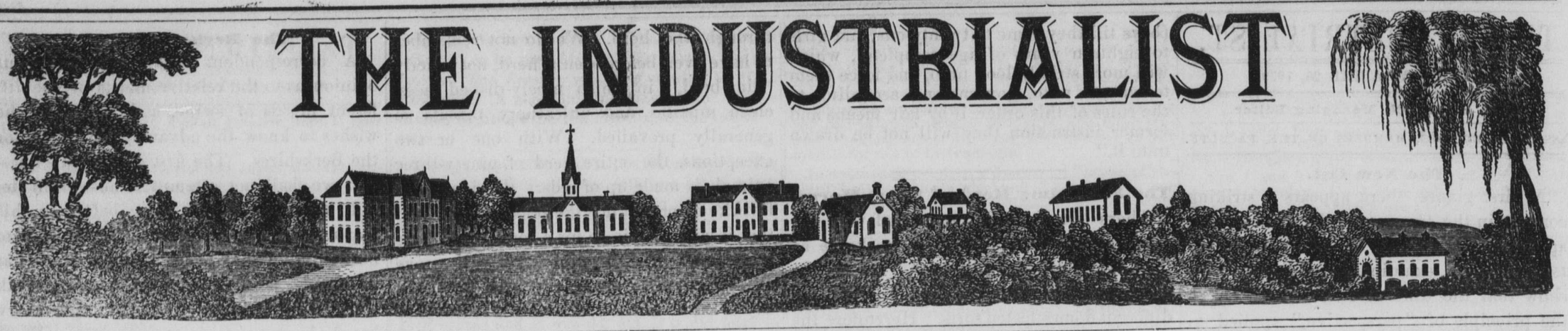
HOUSEHOLD ECONOMY

Follows Household Chemistry and consists of lectures by Mrs. Cripps on the art of house-keeping, embracing cookery, domestic management, and kindred topics. Many elderly gentlemen sufficiently know, and more young gentlemen will duly discover, that systematic knowledge of how cooking ought to be done is luminously different from the ability to do it. Instruction without practice can effect but little. Accordingly, a kitchen laboratory has been completely furnished, and affords every facility for drill in the art of cooking. This drill chiefly differs from that of a kitchen in the respect that after a girl has learned to wash dishes or pare potatoes she is not kept everlastingly at either. After full trial, we have found it just as feasible to give this practice, with profit and pleasure to the pupil, as it is to give laboratory practice in chemistry,—and no more expensive.

Mathematics.—Practical, direct and thorough drill in Arithmetic, Book-Keeping, Industrial Drawing, Algebra, Geometry, Trigonometry, Surveying, Mechanics and Engineering. Work in Field, with Tape Line, Chain, Compasses, Transit and Level. The course is shaped for the benefit of the farmer, mechanic, or business man, rather than for the benefit of the astronomer.

Special for Woman.—Special lectures on Farm Economy, by Prof. Shelton, discussing the Dairy, Poultry, etc. Gardening, by Prof. Van Deman, treating of the vegetable, flower, commercial and ornamental. Household Chemistry, by Prof. Failyer, consisting of the chemistry of cooking, bread, tea and coffee, butter, cheese, dyeing and coloring, bleaching, disinfectants, ventilation, etc. Special Hygiene, by Mrs. Cripps.

THE INDUSTRIALIST



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THE INDUSTRIALIST.

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Address A. A. STEWART, Manhattan, Kas.

The Farmer's Special Need of Education.

There is special need of educational work for farmers. Little comparatively has been done for them. A young man may choose out of hundreds of schools in which to study law or medicine, or the higher mathematics, or Greek and Latin. In these branches, teachers and text-books abound. Schools of civil engineering, even of mechanical engineering and mining, abound, if we take account of the comparative fewness of the classes for which they exist. In agriculture, here and there a school or a professorship struggles against deep-settled prejudices of community, and the inherited axioms of liberal education.

Again, farmers are isolated. There is not that sharp action of mind upon mind which disciplines to quick perception and logical thought the artisans of a manufacturing city. Information, improvements, reach them more slowly than other industrial classes. Again, mechanical works, making of railways, mining, manufactures, employ the masses of laborers under a skilled master, whose education in a sense suffices for all; while in agriculture, the advance depends upon the general progress of the masses themselves.

Besides, the business of a farmer is highly complicated as compared with that of a carpenter, a miller, a manufacturer. An apprenticeship that would fit a young man to compete with co-laborers in most trades would go but little way in fitting him to be a good farmer. Machinery is made according to fixed principles of action, that are simple and to a great extent known. Mechanics is so exact as to go by the name of applied mathematics. It is not so with the farmer's business. Quite a body of empirical rules exist; but underlying principles that would enable one to vary his practice, from a knowledge of the relations of cause and effect, are to a great extent wanting. Until these principles are ascertained, agriculture will be among the arts that have no fixed foundations in science. "To know *well*," says Lord Bacon, "is to understand causes." Liebig says, "There is no profession which for its successful practice requires a larger extent of knowledge than agriculture, and none in which the actual ignorance is greater." Of all the pursuits of man, says Carey in his "Social Science," vol. 2, p. 26, "agriculture is the one requiring the highest degree of knowledge." The processes of nature in the production of plants and animals are hidden: plans cannot be made, giving in their execution exact predicted results, as a machinist can do. The routine found good in one place requires modification with the variations of many circumstances in another. It would certainly seem, therefore, that in no business would knowledge and mental discipline be of more service.

When a farmer understands the breeding and care of his cattle, and the raising of his crops, there is other knowledge needful still. His business has wide relations to the affairs of other men. These he needs to understand. He should be acquainted with the laws of transportation, of trade, and of money. Ex-Governor Seymour, of New York, in a late visit to the Agricultural College, told me that the Cheese Association of his place find it to their profit to have bulletins regarding the markets direct from London. In respect to this much needed knowledge of political economy, farmers as a class are lacking. They are so apt to rest content with what they are told when they come to market, and too apt to plan with reference to the last year's profits only—to rest content in intellectual isolation.

Farmers as a class do not take the social and political rank that their numbers and importance entitle them to. There are about 6,000,000 persons engaged in agriculture in the United States. The census gives 41,106 lawyers. And yet Mr. Perry, the able professor of political economy of Williams' College, is reported in the papers to have said publicly, that he could point out one hundred of those lawyers who have exerted more political influence in the State and nation than all the 6,000,000 farmers have done.

Consideration cannot be forced; it must be the outcome of genuine respect. Legislation cannot reach the case of social and political standing; education can.

There is another drawback to the farmer's business which education only can reach. The sons of farmers who acquire an education forsake the calling. The other occupations of life present more alluring prizes, great wealth, honor and influence.

Were it not that education has generally meant abandonment of the farm; that an education which does not lead to other business is generally regarded, and by farmers themselves also, as wasted; were it not that farming is often devoid of what gives it pleasantness and dignity,—we might hope that many would seek an education in order the better to be farmers.

Professor Andrew P. Peabody, of Harvard University, says with truth: "To restore the deranged balance to society, its old honor must be rendered back to labor. Industrial pursuits must be raised in respectability and dignity above the lower walks of commerce, and fully to a level with its higher departments and functions. Both agriculture and handicraft must be made liberal professions. This can be effected only by stocking them with men of liberal culture; for it is not the profession that gives character and standing to the man, but the man to the profession. Our agricultural colleges and our industrial institutes," he goes on to say, "are supplying the needed culture, and are going to replenish the field and the workshop with a new order of large and high-minded operatives, men of liberal tastes, pursuits and aims, who will do honor to their respective callings, and make them seem worthy the noblest ambition of the aspiring youth of the coming generation."—*President Abbot, of Michigan Agricultural College.*

New Courses of Study.

The rapid advance that we have been making in every way, during the last century, demands that the curriculum of our schools and colleges be changed to meet the every-day requirements of an active and energetic people. Industrial education is already receiving the thoughtful attention of many eminent instructors; and, in those places where it has been given a trial, the results have been quite satisfactory.

Leading spirits in the educational ranks, both in this country and Europe, are ably advocating a course of study that shall more fully meet the requirements of a practical age than the one which requires years of study and labor on the Latin and Greek languages. Already this sentiment has obtaind so strong a foot-hold that several of our leading institutions have placed the languages on the list of elective studies, and make more useful, but hitherto neglected, branches more prominent in their curriculums.

These reforms are encouraging, and we look for others to follow in the same direction. No intelligent person denies that the study of the old tongues is valuable as a means of culture, and for ornament; but can the great majority of students afford to spend many of the most valuable of their years in acquiring that which will be rarely called into requisition in after life?

Herbert Spencer takes strong ground on this point. He says: "The remark is trite that in his [the graduate's] shop or office, or managing his estate or family, or playing his part as a director of a bank or a railway, he is aided but very little by this knowledge he spent so many years in acquiring,—so little that the greater part of it drops out of memory."

Referring to this point, the editor of *Scribner's Magazine* makes the following comments:

"Now, if a smaller man than Mr. Spencer had said this, his words might have passed by as of no moment whatever; but they are spoken deliberately by one of the masters of the age. We are told distinctly that the study of Latin and Greek is almost purely for ornamental purposes, that these languages are of no practical use in the ordinary affairs of life, and that they are used chiefly for show. We very much suspect that Mr. Spencer is right,—or, at least, half right,—and that the whole civilized world, among the highest forces of its civilization, is squandering the best years of its young men—sacrificing them to a fashion. It ought not to be difficult, at this day, to establish a curriculum of liberal study which should embrace mainly useful knowledge."

Such frank confession as this is good for the soul. Let the discussion continue, and the reforms will follow in due time.—*Exchange.*

Our Exchanges.

The demand for American beef, both dressed and on the hoof, is increasing to such an extent in Holland that a company has been organized for the prosecution of the trade. The Dutch port of Flushing is the headquarters of the project.—*Exchange.*

The proprietor of the Hutchinson flouring mill has been experimenting with hay as a fuel for making steam. Heretofore the fuel expense of the mill has been about $15 per day. He finds that, with the addition of another man and some slight modifications in the fire-box, he can run his mill twelve hours on two tons of hay with as good results as heretofore derived from coal. The hay costs only about $1.50 to $2.50 per ton, as coarse hay, or that partly damaged, answers the purpose as well as good hay.—*Wichita Beacon.*

Sam C. King, Esq., of this city, will be the "wheat king" of Kansas before another year. He has recently purchased twelve hundred acres of land between Nortonville and Cummingsville, in this county, and has four hundred and eighty acres near the city. He will next fall plant over fourteen hundred acres in wheat, and of this area over nine hundred acres will be in one field. He is now breaking the ground for this purpose. The land he proposes to devote to wheat culture has been tested, and found to be admirably adapted to the growth of this cereal.—*Atchison Champion.*

A travelling correspondent of the Chicago *Tribune*, in a letter written from Hutchinson, Kas., says: "Arrived again at the gate-cities of this new Empire State, we found the same unwearied human tide, flowing without an ebb, which last year poured its mighty wave over this land of promise. We then wondered where they would all go to. But Kansas is a royal heritage. It can receive its thousand a day; and, when scattered over its boundless plains, they are lost as a river pouring into the sea. Last year, it is said, the population increased agout 150,000; and yet to-day not over one-eighth of its broad domains is occupied, and conquered by the settler's plow. I find that the immigration is distributed to all parts of the State."—*Emporia Ledger.*

THE INDUSTRIALIST.

SATURDAY, APRIL 26, 1879.

E. M. SHELTON, Managing Editor.

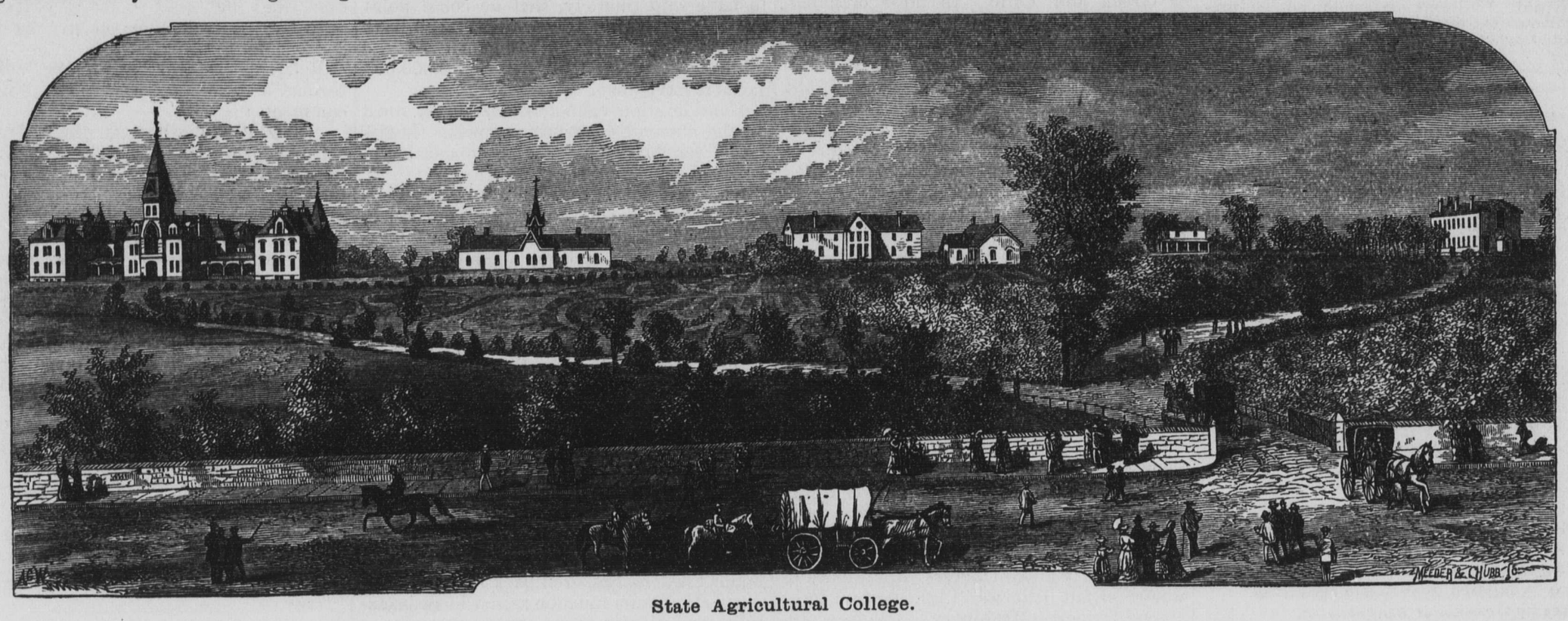
ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

The New Cut.

At first glance there appears a striking contrast in the two cuts of the College that appear in this number of the INDUSTRIALIST. A slight examination, however, will show that the difference is due wholly to the principle of "perspective," applied to both space and time. In the new cut the point of observation is outside of the College grounds, about six hundred yards from the line of the buildings; in time, the perspective is about three years from date.

The new picture shows the plan upon which the improvements have been made during the last four years. The right wing of the main building has been erected, and is already occupied. It will cost about $50,000 to make the representation of the buildings and grounds in the cut a reality; and we confidently expect that sum of money will be appropriated by the next Legislature of Kansas.

But no adequate conception of an institution of learning can be obtained by a view of its buildings and grounds. We wish it were possible to present to our readers an interior view of the Agricultural College,—the good, honest work daily done in shop, office and class-room; the groups of earnest, thoughtful, sensible young men and women as they now are, and what they will become two or three years hence, under the vigorous discipline of our industrial course of study.—*M. L. Ward.*



State Agricultural College.

From the Kansas Edition of Eclectic Series of School Geographies.
Van Antwerp, Bragg & Co., Cincinnati.

GOLDEN grains are often found in gravel. The following is a provision from the blue-law code of a New-England State. Although over two hundred years old, it would be an excellent patch for the present coat of Uncle Sam, if properly adjusted:

"And further, that all parents and masters do breed and bring up their children and apprentices in some honest, lawful calling, labor or employment, either in husbandry or some other trade profitable for themselves and the commonwealth,— if they will not nor cannot train them up in learning to fit them for higher employments. And if any of the selectmen, after admonition by them given to such masters of families, shall find them still negligent of their duty in the particulars aforementioned, whereby children and servants become rude, stubborn and unruly, the said selectmen, with the help of two magistrates, shall take such children or apprentices from them and place them with some masters, for years (boys till they come to twenty-one, and girls to eighteen years of age complete), which will more strictly look unto, and force them to submit unto, government, according to the rules of this order, if by fair means and former instruction they will not be drawn unto it."

The Fairholme Herd of Short-Horns.

There is no one fact connected with the rapid growth of Kansas so remarkable as the very general diffusion among its farmers of pure-bred animals of all the different domesticated sorts. Heretofore the pioneer and settler has contented himself with "scrub" stock, and animals generally of low degree. We have looked back to the older States, New York, New England and Kentucky for blooded stock; and few of us have known that within our own doors, and scattered over all the State with a liberality unknown in New England, were fine herds of the choicest breeding. The unequaled attractions presented by Kansas to the breeder of pure-bred stock are well understood by breeders in the older States, many of whom are turning covetous eyes upon this stock-raiser's paradise. We venture nothing in saying that within the next two years Kansas will be pre-eminent in something besides wheat-growing. She will be among the first of the States in the production of high-bred stock.

These thoughts were suggested by a recent examination of the herd of Short-horns named at the head of this article. Of this grand herd, ninety-three of the choicest animals will be sold at public auction, at the farm of J. C. Stone, Jr., near Leavenworth, May 27th; and, as we looked over this exceedingly promising lot, we were forcibly impressed with the importance to our stockmen of securing and retaining in Kansas this invaluable bovine colony.

We offer the brief discription of this herd given below solely in the hope of being instrumental, to some extent, in securing the retention of this herd within the boundaries of our own State.

At the first glance at this herd, the visitor will be forcibly struck with its great uniformity. Almost the entire herd is made up of two and three-year-olds. There are no old worn-out cows which have quite outlived their usefulness, and are now sold because of their doubtful fertility. Again, while none are in-bred in the offensive sense, yet all have been bred so steadily and persistently in the direction of the best Bates blood that a family resemblance runs through the herd. We do not remember to have ever before seen a herd, not strictly "line-bred," in which nicely-dished faces, clean muzzles, and unleathery throats so generally prevailed. With one or two exceptions, the entire herd of ninety-three animals is made up of reds. Red is not our favorite color, but it is the popular one; and that it will remain so for a long time there is little doubt. Certainly this will prove an attractive feature of the herd upon the day of sale. Finally, the herd is thoroughly acclimated. This is a point upon which we lay great stress. We have, in a large number of cases, seen valuable animals which were perfectly sound in the Eastern States, when brought to Kansas become sterile, often remaining so for months, and in some cases permanently.

In regard to the pedigrees of this herd, it is not necessary to say much. All are of the good, unquestioned sorts; albeit there is a wide range for fancy, as between the fashionably-bred Craggs' and the plainer Seventeens. But whatever is said in this matter by the catalogues or auctioneer the owner will guarantee upon the day of sale, and afterwards. From our acquaintance with the owner of the Fairholme herd, and from the reputation of Col. Muir, the auctioneer, we have no hesitation in saying that the interests of buyer and seller will be equally guarded upon the day of sale. Young and inexperienced breeders may here bid with safety, and feel assured that the fantastic tricks so often resorted to at public sales will not be tolerated here.

In concluding this brief account of a valuable herd, we can do no better than to call attention to the very important fact that this herd has never been pampered, blanketed and "trained" for the sale of next month. Its treatment has been such as is well calculated to develop those sterling qualities,—hardihood and good constitution, which this herd possesses in an eminent degree.—*E. M. S.*

THE French Commissioners, in their report of education in the United States, present the following sad picture of our system of supplying the public schools with teachers: "The profession of teaching seems to be a sort of intermediate stage in one's career,—a stage at which the young woman awaits an establishment suited to her tastes, and the young man a more lucrative position. For many young people this transitory profession simply furnishes the means of continuing their studies." Isn't it glorious?

The Berkshire Pig.

A correspondent writes requesting our opinion as to the relative merits of the different breeds of swine, and especially he wishes to know the advantages claimed for the Berkshires. The first part of this question we shall not attempt to answer in detail, as this has been done before in this paper. Our correspondent will do well to bear in mind that every distinct breed has its strong points, and corresponding weak ones. In some one point, at least, every breed is superior to every other. For a large-framed animal, and a good feeder, with heavy, fat side-pork, the Poland-China is superior; and, on the other hand, for a small, quiet, easy-feeding but moderately prolific sort, especially adapted to a life within the close quarters of the sty, no breed surpasses the Essex. But for the purposes of the general farmer, and especially the western farmer, we are abundantly convinced that no breed can compare with the Berkshires.

Nothing shows the strength of the breed with the general farmer so well as its permanent and constantly increasing popularity. The Berkshire, with other breeds, has passed more than once through what might be called the era of propagation, in which a sort of mania prevails, and enormous prices are paid for individuals. But there is this difference between the Berkshire and many other of the "fancy" breeds. The Berkshire invariably passes through these speculative ordeals, not merely unscathed, but with increased popularity. As a rule, the end of a "mania" for the other breed is the end of the breed, so far as the general farmer is concerned.

The Berkshire is the hardiest and perhaps the least liable to disease of all the breeds. It is wonderfully prolific, and its flesh is unequaled. It matures early; indeed, it may be fattened at any age. These, briefly stated, are our reasons for liking the Berkshires.—*E. M. S.*

THE militia of Kansas will have an encampment at Bismarck Grove during May next.

WE have carefully examined No. 3 of the Eclectic Series of School Geographies (Kansas Edition), published by VanAntwerp, Bragg & Co., of Cincinnati, and unhesitatingly recommend it for general use in Kansas. The chapter on Kansas, compiled by Prof. H. C. Speer, is a marvel in condensation, and is well worth the price of the work.

THE INDUSTRIALIST.

SATURDAY, APRIL 26, 1879.

College Hill never looked lovelier than it does this spring.

There are four hundred and seven students enrolled in the Manhattan public schools.

It does one's eyes good to watch the rapid growth of the wheat west of the Mechanical building.

Manhattan may truly be called the forest city of Kansas. No place of its size in the State contains as many shade trees.

The rain-fall for the week measures .55 of an inch; and, having fallen very slowly, it has done a great amount of good.

Prof. Platt's classes in book-keeping passed their final examination in that study yesterday. They will spend the remaining three weeks of the term in arithmetic.

The Horticultural Department has received, in exchange for some nursery stock, two trees each of three varieties of the much-talked-of Japanese Persimmon. We will now have a chance to test this new fruit. The trees are from California, and are said to be some of the best varieties suited to American culture.

The *Daily Capital*, Topeka, Kansas, is an evening paper, published by Messrs. Hudson & Ewing, of the *Kansas Farmer*. No. 1 of this paper has just been received,—a neat, newsy and ably-edited paper of Republican proclivities. This latest addition to the great family of Kansas newspapers starts out with 1,200 paying subscribers, and gives many indications of having come to stay.

We are under many obligations to the *Nationalist* for the privilege of clipping so liberally from its local columns. We are so situated that it is impossible for us to obtain many items of general interest which it contains; and, therefore, we have always been very free in scissoring its pages. We know of no newspaper in the State which regularly furnishes its readers with as much local news as does the *Nationalist*, and we believe this fact is duly appreciated by its readers.

A letter lately received from Mrs. President Anderson, Washington, D. C., states that, with the exception of her son "B," they are all well, and are nicely quartered in the capital city. "B" has been having the measles, and thinks it hardly fair that he should be given such a reception. Mrs. A. says she knows one "new member" of the House who occasionally gets a little "wrathy" at the proceedings there. It will be strange if John A. doesn't threaten to have a "first-class funeral," or to "shoot about a million or more of those fellows."

At a special meeting of the Alpha Beta Society, held Friday noon, April 18th, the following resolutions were adopted:

WHEREAS, An all-wise Creator has seen fit to remove from this earth Mrs. Harriet A. Buell, the mother of one of our fellow-students,

Resolved, That we, the members of the Alpha Beta Literary Society of the Kansas State Agricultural College, do tender our sincere sympathies to our friends in distress; and,

Resolved, That we do hereby adjourn our regular meeting, in order that all who desire may attend the funeral services.

Resolved, That these resolutions be printed in the INDUSTRIALIST, and a copy be presented to our fellow-student.

Prof. J. C. Shattuck, State Superintendent of Public Instruction of Colorado, in an address delivered last July, at the laying of the corner-stone of the Colorado State Agricultural College, makes kindly mention of our Agricultural College. He says:

"Among agricultural colleges, I am of the opinion that our sister State of Kansas is entitled to pre-eminence in the determination to do the specific work which its name would indicate. It has not impoverished itself by spending its endowment in imposing buildings, but has built only what is needed, in a plain and substantial manner. I commend this example most heartily to our own board of managers. There is a great case being tried in these latter years before the American people; viz., mind vs. brick and mortar, as an educating power. How many institutions of learning have been shipwrecked because the founders built a magnificent edifice and then were too poor to employ first-class minds.

The Webster Society met as usual on last Saturday evening, with President Wood in the chair. The two assistant debaters being absent, the remaining two were allowed to "go it alone." Question decided in the negative. The committee on books reported that it had purchased the works known as Paul and Virginia, Longfellow's and Whittier's poems, Christmas Carols, Ivanhoe, Talisman, Betrothed, and Vicar of Wakefield; and also that the Conquest of Peru, by Prescott, had been ordered. The Society also received a donation of one volume of Ingersoll's lectures.

There will be no debate next Saturday evening, owing to the fact that the Alpha Beta Society is expected to be present, and take part in the exercises. The *Reporter* will be presented by H. C. Rushmore. A good time is expected, and all are invited to attend the last meeting of the two societies.

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Friday, April 25th, the Alpha Betas met at the usual hour. Roll-call was followed by a warm debate, which finally resulted in the decision that ability to read and write should be necessary qualifications for voting in the United States. Our quartette then favored us with "The Singin' Skewl." The *Gleaner* was presented by W. J. Jeffrey and Miss Mary Clarke. It was full of fun and good sense; and it was not old, if it did have to wait over one week. The Chinese question was introduced for extemporaneous speaking, and all the members confined their remarks to this topic. This exercise was interesting and exciting. Several of the Webster boys were present and took part in the discussion. Under miscellaneous business, Mr. Blain moved that a committee of three be appointed to solicit money and books for our library. The motion was carried. Question next week is, "*Resolved*, That it would be for the best interests of the Unites States to remove the colored people from the South, and distribute them throughout the North and West."

PROGREDIMUR.

NATIONALIST ITEMS.

Will Brous is clerking at Wareham's.

Work has commenced on the addition to the post-office.

G. W. Higinbotham shipped about 12,000 bushels of wheat this week.

Poyntz Avenue is being macadamized between Third and Fourth streets.

The lumber to refloor the Kansas bridge is on hand, and work will be commenced immediately.

More trees have been set out on our streets this year than ever before, and we will soon have a forest home.

Everything is putting on its beautiful coat of green since our nice rain. The school-ground is a pretty sight now, with its even rows of green-leaved trees.

Miss Susan B. Anthony delivered a lecture at the Presbyterian Church, Thursday evening, on "Woman wants Bread, not the Ballot."

Our first installment of negroes (120) from the South arrived at the depot Thursday morning; and provisions were made for their maintenance by the authorities until they can find work and homes.

The Young People's Christian Union will hold a concert and social at the Congregational Church, Thursday evening, May 1st. A cordial invitation to all interested in music or the welfare of the Union. No admission fee.

The contract for Fox's building was closed, and work commenced this week. It is to be of stone, 25x60 feet, two stories, with iron front. It will close the gap on the south side of the avenue, between Second and Third streets, and will be a great improvement to that portion of the avenue.

Among the students reaching the first rank during the month of March, having made an average grade of 95 or over, at the Agricultural College, at Manhattan, we are proud to notice one of our town boys, Lewis A. Salter.—*Independence Kansan.*

DIRECTIONS TO APPLICANTS.

TERMS OF ADMISSION.

Candidates for admission must be fourteen years of age, and pass a satisfactory examination in reading; arithmetic, through decimal fractions; and English grammar, to syntax. Classes are started at the beginning of each year in Drill in Arithmetic and Drill in English; and the pupil must have the knowledge above indicated, else he will be unable to retain position if admitted.

Pupils will be received at any time during the year, if able to pass an additional examination upon the subjects studied by the classes which they expect to enter. But they will find it greatly to their advantage to be present at the opening of each term, or as soon thereafter as posssble.

GRADES.

Both the Literary and Industrial recitations are graded daily upon a scale of 100; and an examination of all classes is made at the close of each month. A student not attaining an average grade of sixty is promptly dropped to a lower class, or excluded from the Institution until able to do so. The work of grading is strict and uniform in all the departments, and this process is rigorously used for sifting out incompetent and indolent pupils; thus more than accomplishing all that is designed to be effected by a "high standard of admission." Hence, the student's continuance in the College wholly depends upon his own action.

The course is based upon the determination to make the labor required in the preparation of one industrial and three literary recitations as much as the average student can perfectly perform, in ten hours a day. We design to give the pupil the worth of the time expended at College; and, in order thereto, he must do a full day's work with brain or hand. Only those students who can maintain a standing of ninety in each study will be allowed to take more than the prescribed number of recitations; and no one will be permitted to have less than one industrial and three literary recitations.

RELIGIOUS.

Unless otherwise directed by parents, students are required to attend chapel at 8:30 A. M. on academic days, and divine service once every Sabbath.

EXPENSES.

There are no charges whatever for enrollment, attendance or instruction in the regular courses; nor are there any "contingent fees" for the repair of buildings, for the use of books or apparatus, for diplomas, or the kindred privileges usually grouped under the term "contingent." Male students are furnished instruction, the use of apparatus, instruments or tools, in both the literary and industrial classes marked out for them, without any charge. And the same is true of female students in the regular classes provided for them. Printing and Telegraphy are industrials primarily provided for the education of female students, and male students taking either of these are charged $1 per month for use of instruments.

Instrumental music is a fine art or "accomplishment," rather than a mechanical art. We do not place it among our "industrials" in the same sense, or for the same purpose, that we do those provided for teaching the trades. Accordingly, a fee of $12 per term, or seventy-five cents per week is required from female students for tuition and the use of pianos or organs.

The only charge made for material in either the literary or industrial departments is for the chemicals used by students in laboratory practice, which are furnished at wholesale prices, and amount to but a small sum.

Furnishing an absolutely free education is as much as can be reasonably asked; and the Institution neither boards, clothes, nor supplies the student with text-books. Boarding can be obtained in private families at from $2.75 to $4 per week. Washing costs from seventy-five cents to one dollar per dozen. Text-books, which can be procured in Manhattan, cost from $2 to $5 per term.

No student need expend over $5 per week; and many of our best pupils are living at $1.25 per week. Students desiring to "board themselves" can do so at from $1 to $2 per week. In a club of four young men, renting a house, the average cost to each for the term was $1.11 per week.

LABOR.

Manual labor by the students may be for either of two purposes: First, to acquire skill in a given art; second, to earn money. In the first case, the labor is educational; in the second, it should be paid for by the party benefited.

Educational Labor.—Manual labor in the recitations of the Industrial Departments, like mental labor in those of the Literary Departments, is purely educational and will not be remunerated. While the interest of the student will be held paramount in the direction of this labor, the practice necessary to dexterity will be required.

Remunerated Labor.—When the Institution needs labor on the Farm or elsewhere which is not educational, but simply for its own profit, and which a student is able and willing to perform, it becomes an employer instead of a teacher, and he an employe instead of a scholar. It pays for work, he works for pay. The relation between them is commercial, not educational; and both parties must act upon business principles. Hence, the College furnishes only such employment as its own interests require, and will pay according to the value of the service rendered at from seven to ten cents an hour.

AMOUNT EARNED.

It is impossible to predict how much a given person can earn, since that depends upon what he can do and what work there is to be done. Hence, it is wholly impossible for us to answer the question so often asked: "Do you think I can meet my expenses by work?" Some students make one-half their expenses, some the whole, and exceptional men have made more than expenses. As a rule, a faithful boy skilled in farm work can earn half his expenses on the Farm or in the Nursery. During the year he can ordinarily acquire sufficient skill in the wood or iron shops to enable him to make articles for sale. The whole question is one for his own consideration and decision. We can teach all who come, but cannot absolutely *promise* anything more. Hitherto we have refrained from holding out strong inducements respecting the amount of labor we might have to offer; but in view of the fact that during each of the last three years we have had more to do than the students could perform, we are inclined to give greater and positive encouragement on this point. Any boy who is in dead earnest, who is familiar with farm operations, and who can raise $50 to start with, should be able to carry himself through the four years' course. And certainly this places an education within the reach of every determined boy. As yet we are unable to offer similar advantages to girls, not requiring labor in the College departments which they can perform.

RULES.

1. Behave as a true man or woman should, at all times and in all places.

2. Attend to your own business promptly, thoroughly and courteously; and vigorously let alone that of other people.

3. Penalty: "Leave!"

PUBLICATIONS.

The "Hand-Book," published in 1874, containing a full discussion of the educational question and the aims of the Institution, will be forwarded to any one desiring it.

THE INDUSTRIALIST, a weekly journal edited by the Faculty and published by the Printing Department, contains original and seasonable articles on the Farm, Orchard, Trades, Sciences, and Education. Price, 75 cents a year. Address A. A. Stewart, Manhattan.

CALENDAR.

Winter Term 1879.—Began Friday, January 3d, 1879.

TO NEW STUDENTS.

Bring the text-books you have been using. On arrival, first arrange for your boarding. A. A. Stewart, Sup't Printing Department, will furnish information, either by letter or on application, concerning boarding places or rooms for rent. Report to the President at 8:30 A. M., immediately after chapel, for enrollment.

For further information apply to Jno. A. Anderson, President, Manhattan, Kansas.

LITERARY SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in College building every Friday at 2 P. M. Ladies admitted. New students cordially invited to attend. GEORGE PERRY, President.
MISS GRACE PARKER, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Telegraph Hall every Saturday evening. Visitors, especially students, always welcome.
C. E. WOOD, President.
C. M. SHARTEL, Secretary.

RAILROAD TIME-TABLE.

KANSAS PACIFIC RAILWAY.

PASSENGER ARRIVES.

No. 2, going East	11:14 A. M.
No. 4, going East	3:47 A. M.
No. 1, going West	5:10 P. M.
No. 3, going West	4:33 A. M.
No. 7 (freight), going West	8:15 A. M.

Nos. 1 and 2 run daily; Nos. 3 and 7 run daily except Monday; No. 4 runs daily except Sunday. Passengers with tickets are carried on No. 7.
GEO. C. WILDER, Agent.

THE INDUSTRIALIST.

SATURDAY, APRIL 26, 1879.

INDUSTRIAL EDUCATION.

The real value of an education to the student depends upon two things: First, the practical worth of the knowledge taught; and, second, the degree in which he makes it his own. Hence, the ability of any institution to give a practical education depends upon the kind and aim of the knowledge it teaches, and upon the thoroughness of the instruction therein. The State Agricultural College was directly endowed by Congress, and is guided by the State, for the specific purpose of furnishing to the industrial classes of Kansas a "practical" education, that is, "one fit for use." As its name indicates, and as the statistics of the industries of the State require, its chief work must be that of giving a useful and usable education to those who will engage in farming; and, therefore, the Farmer's Course must, from the nature of the case, be its main one.

FARMER'S EDUCATION.

Words and figures are merely instruments with which to record ideas. They are not themselves ideas, nor should they be made the chief end of an education. As a wagon is necessary to haul grain, so are they a necessary part of an education; but as the wagon is not the grain, so they are not the knowledge which the farmer converts into money. Hence, the classics and higher mathematics are not taught. But it will be noticed in the following course that so soon as the pupil acquires working skill in the use of the English language as a tool, and of figures and lines as mathematical tools, those arts and sciences which present knowledge that has a cash value to the farmer are taught as rapidly as their importance and thorough acquisition will permit. Studies numbered (1) and (4) in the second, third and fourth years are the spine of the course, to which the others are as ribs and muscle.

FARMER'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Practical Agriculture (advanced.)		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	
3. Polit. Economy, Practical Law.		3. Practical Geometry.		3. Algebra.		3. Industrial Drawing.	
4. Zoology.		4. Horticul., Landscape Gardening.		4. Practical Agricul. (elementary).		4. English Structure.	
5. Agricul. Chemistry	Meteorology.	5. Organic, Analytical Chemistry.		5. Physics.		5. Adv'd Arithmetic, Book-keeping.	
6. Logic.		6. Practical Surveying.		6. Industrial Drawing.		6. U. S. History, Industrial Drawing.	

WOMAN'S EDUCATION.

Nearly one-half of our students are females, and the Woman's Course is prepared expressly for their liberal and practical education. We have no doubt whatever that practical men and women, who understand what it means and what it seeks to do, will fully endorse it.

WOMAN'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Farm Economy, Special Hygiene.		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	
3. Polit'l Economy, Practical Law.		3. Industrial Drawing.		3. Algebra.		3. Industrial Drawing.	
4. Zoology.		4. Horticul., Landscape Gardening.		4. English Literature.		4. English Structure.	
5. Phys'c'l Geography, Meteorology.		5. Organic, Household Chemistry.		5. Physics.		5. Adv'd Arith., Book-keeping.	
6. Logic.		6. Household Economy.		6. Industrial Drawing.		6. U. S. History, Industrial Drawing.	

MECHANIC'S EDUCATION.

Because of the adaptedness of the leading course to the wants of the intelligent mechanic, it has been found practically unnecessary to diverge from the Farmer's Course. Additional studies, specially adapted to the mechanic's use, will be furnished in a Post-Graduate's Course.

If it be urged that the distinctively agricultural knowledge taught in the Farmer's Course is not directly valuable to the mechanic, we reply that, admitting the point for the purpose of argument, yet: 1. This knowledge is of more practical value to the mechanic than is the Latin, Greek, or a half dozen other things embraced in the usual course preparatory to the professions; 2. That the great majority of Kansas mechanics will also be more or less engaged in agriculture; 3. That those studies in the course which are directly valuable to the mechanic, together with the shop facilities, offer a better mechanic's education than can be elsewhere found west of the Alleghanies.

INDUSTRIAL DEPARTMENTS.

Having knowledge in the head is one thing; ability to use it with the tongue, fingers or feet is quite another thing. Both are vital to success in practical life. A man might thoroughly understand the theoretical principles of carpentry, and yet, not having used the tools, be wholly unable to earn carpenter's wages. So in all other vocations. Accordingly, instruction is given in the following well-equipped Industrial Departments, and every student is required to recite in some one of them, as selected by the pupil or parent:

FOR MALE STUDENTS.	FOR FEMALE STUDENTS.
The Farm.	Dress-making.
The Nursery.	Printing.
Carpentry.	Telegraphy.
Cabinet-making.	Scroll-sawing.
Turning.	Carving.
Wagon-making.	Engraving.
Painting.	Photography.
Blacksmithing.	Instrumental Music.

Each of these departments is conducted exactly as in daily life, and aims to give precisely the drill received by an apprentice. No charge is made, either for tuition or material, from male students taking the Industrials provided for them; nor from female students taking the ones provided for them, except in the Department of Instrumental Music. Male students taking either Printing or Telegraphy are charged $1 per month for the use of material and instruments.

DEPARTMENTS OF INSTRUCTION.

DEPARTMENT OF AGRICULTURE.

PRACTICAL AGRICULTURE.

Second Year:—General principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage.

Fourth Year: General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of a rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farmhouses; barns.

FARM ECONOMY.

Woman's Course, Fourth Year: Dairy products as human food; influences affecting character of milk; manufacture of condensed milk; the factory system and household plan of cheese-making; treatment of rennet; general process of cheese manufacture; subsequent treatment of cheese; butter-making; creameries; "deep" and "shallow" setting systems; general process of butter-making; packing and preserving butter.

DEPARTMENT OF BOTANY AND PRACTICAL HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest; also a course of lectures on Landscape Gardening. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard; fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture; shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in in the work of laying out and plotting grounds topographically.

CHEMICAL DEPARTMENT.

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life. Text-book, Ganot.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blowpipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

Are constantly in progress in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

DRILL IN ENGLISH.

"As grammar was made after language, so ought it to be taught after language."—*Herbert Spencer.*

Drill in English embraces the following topics:

Sounds of the language; drill in producing the vocal, sub-vocal and aspirate elements with accuracy, distinctness and volume; vowels, consonants.

Letters: Form; power; rules for spelling, drill.

Words: Signification, properties, modifications, variations, relation and dependence.

Sentences: Drill in statement of ideas; description, clearness, terseness, vigor; business letters, discussion; capitalization; syllabication; punctuation; construction and analysis of sentences; elements, uses and names; criticism of compositions printed as written; proof reading; grammatical construction; superfluous words and clauses; drill in reading, speaking and penmanship.

Text-books: Webster's Academic Dictionary; Lee & Hadley's Advanced Lessons in Language.

Pupils deficient in spelling, etc., should enter the printing class, the printing-office being the work-shop of language.

STRUCTURE OF ENGLISH.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

MATHEMATICAL DEPARTMENT.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

DRILL IN ARITHMETIC.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Following this line, the student, so far from hammering away at "pure" science draws from the mathematical store-house what he needs, and sees why he needs it. Accuracy of calculation and posting, rather than a *mere* comprehension of the principles, is aimed at. Besides the recitation-room drill in business forms, practice in the field is also given. Estimating the number of cords in a pile of wood said to be 100x4x4 feet is one thing; measuring a pile of wood through which any number of cats may be harmlessly thrown, and in which four-feet sticks are the exception, is quite another and more difficult thing.

ARITHMETIC AND BOOK-KEEPING

Is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides ensuring arithmetical practice, develops practical skill in that important art.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admiral system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study. In addition, constant practice in the application of lines to metal and wood is furnished in the Blacksmith, Carpenter, Turning, Scroll-sawing, Carving, Engraving and Printing shops, and to fabrics in the Sewing Department.

PRACTICAL GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the use of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

PRACTICAL SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodlite.

STUDIES SPECIAL TO WOMAN.

Besides the studies already indicated, attention is called to the following:

SPECIAL HYGIENE.

As shown in the course, one term is devoted to the study of Physiology, from the text-book of Dr. J. C. Dalton. This is followed in the fourth year by a course of lectures to young ladies by Mrs. Cripps on the subject of Hygiene, embracing such instruction in hygienic matters as are valuable to woman.

FARM ECONOMY considers those affairs of the farm which usually come under the supervision of the farmer's wife or daughter, and which are not included in "gardening" or "household economy;" such as butter and cheese-making, dairy management, etc. A course of lectures is delivered by the Professor of Practical Agriculture. See heading, "Farm Economy."

GARDENING is included in Practical Horticulture. See heading, "Landscape Gardening."

HOUSEHOLD CHEMISTRY. See heading, "Household Chemistry."

HOUSEHOLD ECONOMY

Follows Household Chemistry and consists of lectures by Mrs. Cripps on the art of house-keeping, embracing cookery, domestic management, and kindred topics. Many elderly gentlemen sufficiently know, and more young gentlemen will duly discover, that systematic knowledge of how cooking ought to be done is luminously different from the ability to do it. Instruction without practice can effect but little. Accordingly, a kitchen laboratory has been completely furnished, and affords every facility for drill in the art of cooking. This drill chiefly differs from that of a kitchen in the respect that after a girl has learned to wash dishes or pare potatoes she is not kept everlastingly at either. After full trial, we have found it just as feasible to give this practice, with profit and pleasure to the pupil, as it is to give laboratory practice in chemistry,—and no more expensive.

Mathematics.—Practical, direct and thorough drill in Arithmetic, Book-Keeping, Industrial Drawing, Algebra, Geometry, Trigonometry, Surveying, Mechanics and Engineering. Work in Field, with Tape Line, Chain, Compasses, Transit and Level. The course is shaped for the benefit of the farmer, mechanic, or business man, rather than for the benefit of the astronomer.

Special for Woman.—Special lectures on Farm Economy, by Prof. Shelton, discussing the Dairy, Poultry, etc. Gardening, by Prof. Van Deman, treating of the vegetable, flower, commercial and ornamental. Household Chemistry, by Prof. Failyer, consisting of the chemistry of cooking, bread, tea and coffee, butter, cheese, dyeing and coloring, bleaching, disinfectants, ventilation, etc. Special Hygiene, by Mrs. Cripps.

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Food Crops.

The Carolinas and Louisiana are credited with the production of 80,000,000 pounds of rice annually. How far does this go toward feeding the rice-eating population of the earth? A very little way. Oriental countries, where rice is largely used for food, produce more than 250,000,000,000 pounds; so that our production of this staff of life is some 3,000 times less than the production of the other countries spoken of. Wheat is called the staff of life; and yet it cuts a very inconsiderable figure beside the rice crop, which forms the principal food of about 800,000,000 of the earth's inhabitants, and is used more or less by a large proportion of all civilized nations besides. It is only utterly savage nations who use none of the cereal grains.

The rice crop, as compared to wheat, falls short of it in money value astonishingly. The last wheat crop of the United States was estimated at 330,000,000 bushels; that of the world, at 1,519,775,000 bushels. The rice crop of the United States, reduced to bushels, would make about 1,333,333 bushels; that of the world may be called 4,235,000,000 bushels. So that we see that rice forms nearly three times the food product of the world as compared to wheat.

Corn is largely used as food in many countries; but as a food cropit cuts but a small figure in the aggregate, consumed either whole or ground. As a crop for fattening food animals, however, it enters largely as an integer in human-producing food. The United States raise probably three-fourths of all the corn in the world, and nine-tenths of this is consumed by cattle, hogs and horses. This is what enables us to produce meat so cheaply, and export it to all parts of the world. Corn also enables the West to feed cows cheaply; and thus we can export vast quantities of cheese, which, with butter, must be an increasing quantity, so soon as manufacturers learn that either of these articles for export must be only the best. Compared with our rice crop at four cents a pound, $3,200,000 on the plantation, corn at an average of thirty cents a bushel is worth, estimating the crop at 1,500,000,000 bushels, the sum of $450,000,000. It may safely be taken at this as its average value for making meat. Here again we may make a comparison. Corn, $450,000,000, and the wheat of the United States at one dollar per bushel, $330,000,000, or a total of $780,000,000, as against the rice product of the world at two cents per pound, would leave a balance in favor of the rice crop of over $4,200,000,000. * * * * *

Some of the curiosities of wheat growth in the United States may here be mentioned. The wheat zone constantly travels west. In comparing values, we stated the wheat at its lowest figures. It will really foot up about 400,000,000 bushels, according to later reports from the Department of Agriculture at Washington. The quantity of wheat grown in the United States last year was nearly four times the quantity grown twenty-five years ago, and that portion of the crop grown west of the Mississippi last year was greater than the entire crop of 1849. Then only five per cent of the crop was produced west of the Mississippi; now sixty per cent of the crop is grown there.

One principal reason why the wheat zone constantly travels west is, wheat is a crop easily raised on virgin land; it is also a crop that always commands cash, and will bear transportation for long distances. As the country becomes settled, diversified farming takes the place of single crops, as wheat, until at length it becomes a crop of minor importance. In the Atlantic States wheat has about held its own for the last thirty years, not in proportion to increase of population, but in the annual yield. In 1849 that section produced 52,000,000 bushels, about one-half the country's product; in 1878, 60,000,000, about one-seventh the yield of the whole country. In the last 30 years the central belt of country between the Alleghanies and the Mississippi River has raised its wheat production from 44,000,000 bushels to 150,000,000, while the trans-Mississippi country may be credited with the balance of the production.

Not less singular is the vast increase in Indian corn. While the population of the West has doubled, the increase of the corn crop has more than doubled; and, like wheat, nearly the whole of the crop is raised in the West. Year by year this increase will be carried on as State after State is settled. There is yet plenty of room for increase in the corn crop, if the farmer is only wise enough to keep it at home for fattening stock, and does not try to force it on the market as a cash crop. A certain amount will be taken each year, but at a low price. The real value of corn lies in feeding it to stock. In this direction there is practically no limit to which the production of Indian corn may not be carried. A very slight decrease in the price of meat carries with it an increased consumption. Once this meat-eating habit is formed, it will not cease. Hence, seasons like the last, of low prices of beef, and especially of pork, may be expected to tell in increased consumption by the people of foreign countries, in the future.—*Prairie Farmer.*

Brief History of the College.

In 1859 the Methodists, under the leadership of Rev. Joseph Denison, D.D., and Hon. I. T. Goodnow, organized Bluemont College. During the same year a building was erected about three miles northwest of Manhattan. Through the exertions of these gentlemen, a library of nearly 2,500 volumes was collected. The institution was under the auspices of the Methodists until 1863, when it became a State institution.

It received its present name and was reorganized in accordance with the provisions of an act of Congress, approved July, 1862. By this act 30,000 acres of the public domain, for each Representative in Congress, from the different States, were donated to endow colleges which might be established "to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life."

The interest of all moneys derived from the sale of these lands is to be inviolably used for the current expenses of these institutions, the States accepting these donations agreeing to provide buildings and apparatus. At that time Kansas had only three Representatives, yet her 90,000 acres of land were so well located by the Commissioners—Hon. I. T. Goodnow being one of them—that when all the lands are sold the income of the Kansas State Agricultural College will exceed that of the Agricultural College of Massachusetts, although Massachusetts received 360,000 acres.

From 1863 to 1873 the course of instruction in the Kansas State Agricultural College very closely resembled the courses of instruction usually given in purely literary and scientific colleges.

On the first day of April, 1873, and in accordance with an act approved March 6, 1873, a new Board of Regents assumed control of the Kansas State Agricultural College. During that summer radical changes were made in the management and methods of the institution, and on September 3, 1873, the Board officially announced its purposes in the following words:

"For the purpose of defining the policy of the Board of Regents of the Kansas State Agricultural College, and as a guide to the Faculty in preparing a new curriculum,—

"*Resolved*, That the object of this institution is to impart a liberal and practical education to those who desire to qualify themselves for the actual practice of agriculture, the mechanic trades, and industrial arts.

"Prominence shall be given to agriculture and these arts in the proportion that they are severally followed in the State of Kansas.

"Prominence shall be given to the several branches of learning which relate to agriculture and the mechanic arts, according to the directness and value of their relation."

During the past six years this line has been strictly followed, not merely in profession, but in spirit and fact. The course of instruction, which as certainly determines the direction of the student's progress as do the rails the direction of a train's movement, has been rebuilt and fully conformed to this policy. The several departments of instruction have been entirely reconstructed; and are manned by able and enthusiastic specialists, harmoniously working with hand and brain for the speediest attainment of the designated object. To the outer limits of the facilities at their disposal, both the Regents and their appointees have used all legitimate means, and made every effort, to put within easy reach of the working classes of Kansas exactly that knowledge and physical drill which are of most value to those who expect to earn a livelihood by farming and other industrial pursuits.—*Orphans' Friend.*

Our Exchanges.

The *Rural New Yorker* says the natural grasses of Kansas are more nutritious, and better relished by stock, than the cultivated grasses of the East. This is strongly suggestive of stock-raising, and we earnestly hope the hint may not be thrown away.

The Santa Fe road is about establishing weather signals along its stations. These signals will be about twenty-five miles distant from each other, and will be under the direction of the U. S. signal corps. Thus storms will be heralded in advance, and timely warning given.—*Topeka Blade.*

N. B. Wood, an attorney of Troy, has, adjoining the town, an apple orchard containing about 15,000 trees. One crop will "heel" any poor man. At least our item gatherer would be content the rest of his life, if he could have the proceeds of one year's crop. "Boney," send us down a barrel next fall.—*Atchison Champion.*

A New Jersey firm, extensively engaged in the fruit-canning business, has purchased lots in Atchison, and will erect a building for canning tomatoes. Some fruit was canned at Lawrence last year, but we believe this is the first canning establishment in our State. If properly conducted, fruit canning in Kansas can not fail to prove very profitable.—*Topeka Capital.*

Robert Milliken, of this city, has received from Japan, via California, about two hundred young Japanese persimmon trees, the first ever introduced into this country. The fruit of this tree, Mr. Milliken informs us, is to the Japanese what the apple is to the American, and is cultivated in endless variety, the same as the apples in this country. This tree has been for a few years past successfully cultivated in California, and it is thought that it will do equally as well in this State. If so, it will prove a valuable addition to our fruit-bearing trees.—*Emporia Ledger.*

THE INDUSTRIALIST.

SATURDAY, MAY 3, 1879.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

Teaching Everything.

In a late number of the New York *Tribune*, the Elmira *Gazette* is quoted as saying of Cornell University: "At the present time there are but 403 students of both sexes attending the University, and only about 350 young men against about 700 when the experiment began." After stating its belief that this large falling off is due solely to the experiment of bisexual education, the *Gazette* mournfully adds: "That President White should be called upon to leave the University at this the lowest ebb of its fortunes * * * is a matter of regret to those who have the best wishes of the University at heart. Altogether, the prospect for Cornell's future is not all that heart could wish."

All of which, in our judgment, goes to show that a mistake has been made somewhere. Cornell is an advanced type of a large class of institutions in this country. Its founder started out with the idea that he would found an institution where "any person can find instruction in any study." Now, the organic act which called these institutions into being provided that their "leading object shall be, without excluding other scientific studies, and including military tactics, to teach such branches as are related to agriculture and the mechanic arts." This means one of two things. It means either that these colleges were to follow a special line of work, which ended in the great industries of the country; or they were to teach "any study," and simply duplicate the ordinary literary, scientific and professional courses of study. If this last is true, then a gross injustice has been done the old institutions, which Congress ought not to be slow to correct. These institutions of learning, by common consent, were already, in point of numbers, beyond the wants of the country. Their great need has been students, and in many cases money; and their struggles for both have often been carried beyond the limits of dignity. For Congress to step in at this juncture and richly endow new institutions for a work that was already overdone, was to be guilty of a waste of means never before equaled in educational history.

We have no desire, at this time, to argue the question as to the intent of the organic act so often quoted. This has been often and ably done by President Anderson and others in these columns. We have always held to the opinion that these industrial colleges were called into existence for a special purpose; that their "leading object" was not the teaching of "Persian," "Danish" or Choctaw, or "any study," but those studies which are useful to working people as such. Here was a field wide enough to satisfy any honorable ambition, and in it Cornell would have had no rivals; but she saw fit to abandon this vantage-ground; and the ambition of her managers seems to have been to establish a great university, differing in no essential respect from scores of other institutions then in existence. That Cornell should be thus left behind in the race with older colleges is not surprising, and not much to be regretted.

The fact that the older institutions of general learning, even where the bisexual experiment is being tried, were never more flourishing than at present; and the additional fact that the professional and technical schools are doing equally as well,—seem to us ample refutation of the charges made by the *Gazette* that the decadence of Cornell is attributable solely to the bisexual experiment. Cornell brings down no game because she uses a shot-gun where she should employ a rifle.

We shall next hear Cornell referred to as "another instance of the failure of these agricultural colleges." Heaven save the mark! Had Cornell directed her energies solely in the direction of agriculture and industrial education, with her forty-nine professors and instructors, her vast endowment fund and splendid apparatus and buildings, she would have been a power in the land, and beyond the reach of all ordinary reverses.—*E. M. S.*

Education in Switzerland. No. VII.

Switzerland has three universities,—at Bern, Basel, and Zurich. In their general management, there is little difference. The one at Zurich has the greatest attendance, and is perhaps the most aggressive in regard to those revolutionary ideas which at present shake the petrified dogmas of the middle ages, in every field of human knowledge; while the one at Basel may be called the most conservative. All these seats of learning are centuries old, and boast of many great spirits, nursed at their bosoms. But none of them has a building that can be compared with our palace at Lawrence. As in Germany, the different lecture-rooms are situated in different buildings, and these again are located in different parts of the towns; so that it is quite difficult for a stranger to find them. Most of these rooms, though high and often of rare architectural beauty, are smoked up and narrow. They remind a visitor of a refectorium in a monastery, centuries before our time; yet the spirit oscillating in these dreary halls is in direct opposition to that of those days: there it was imagination and here it is perception, that furnishes the base for the reasoning faculties to build upon. Rigid examinations and a ripe age prevent all immaturity from occupying the rough, iron-trimmed college benches; while the cathedras are filled with the best talent and the most vigorous brains that wages and honors can secure.

All three universities are giving full courses in philology, philosophy, law, medicine, and theology; and students that wish to make combinations from different departments are permitted to do so. The instructions are given in the form of exhaustive lectures, at the close of which the professor states the authors and perhaps the pages where the subject in question can be further pursued. The student is not requested to recite upon the subject in any form: he is old enough and ought to know better than to squander the precious university days. The reason for this is undoubtedly in the fact that it is not deemed wise by European educators to waste the energy of the professor on disciplinary points. Experience must have proved, too, that students of a ripe age will work as well or better without any pressure.

To an American it seems queer that, in the midst of a labyrinth of petty laws and police, attached to everything and watching everybody, the students should enjoy liberties which we do not grant them over here. Not only are they free from all school-mastery in the lecture-room, but also outside of it,—free like the Papuans in Australia. What I have said in regard to smoking, beer drinking, and hazing of the gymnasiast, applies in a greater degree to the university student. After a week of hard study, Saturday and Sunday are generally devoted to excursions into the near woodland, or to beer gardens in the suburbans of the city; and there the never-returning days of happy youth are spent in chanting "Gaudeamus Igitur" and drinking songs, in extemporaneous speaking upon any imaginable subject, and in fighting fist and sword duels, which are often enough bloody if not dangerous affairs. A German or Swiss doctor or statesman, or even clergyman, without a few sword-scars in his face, is a rarity. The students' societies, called "landsmanschaften," easily distinguished by the color of their caps, are a chief source of this practice. There is much less of this stupid fighting done at present, however, than in the past; and the next quarter of a century will undoubtedly do away with these remains of the barbarous ages.

Our travelers in Europe have been much interested in student life over there; but most of them have applied the colors rather thick. Facts prove that it does not lead to utter destruction there, as it would with us. The wildest students are often the most conservative citizens in riper years; and the whole inner life of the Germans, be they Prussians, Saxons, Austrians or Swiss, shows that they can have their fun and then be sober again.

A discussion of the work of these universities would reach beyond the object of these articles. I advise my young friends to go abroad and spend a few semesters at Bern, Basel or Zurich, after completing their studies here. In the halls of the University and the Polytechnicum at Zurich, they will find perhaps fifty young Americans, learning Teutonic persistency, if nothing else of much value. After all, the most thorough school learning is incomplete. It must be followed by a thorough course in the "Knock About University," as Prentis puts it; and no nation on earth has one-third as many seniors in that grand school as we have. The Swiss may have more persistence, but the western American excels in shrewdness.

In conclusion, I would say that we can learn of the Swiss six things in regard to education: First, that we must have the phonetic alphabet and the metric system ot measurements; second, that teaching is a profession which requires a natural aptitude and much careful preparation; third, that we must have and enforce compulsory attendance laws; fourth, that we must unite our forces and sympathies for the support of State institutions; fifth, that we must make our schools more practical; sixth, that we must have sewing schools for the girls and trade schools for the boys.—*J. D. Walters.*

THERE are in the State 4,520 school-houses, valued at $4,052,918. Of these, 246 are log, 3,475 are frame, 157 brick, and 642 stone. The school furniture is valued at $394,051; apparatus, $65,221; and libraries, $15,039: a total, including the value of the school-houses, of $4,525,215. Increase in total value during the year past, $250,133.

FROM the report of our Bureau of Education, published a short time ago, it appears that the "household plan" has been adopted by Prussia. Of the ninety seminaries for male teachers, forty-four are boarding and lodging establishments, twenty-seven are only places of instruction, while in the remaining twenty-eight some accommodations are provided for the students. The instruction given in them is gratuitous; and at least one-half of the living expenses of the students are borne by the State. Everything is provided which can contribute to the perfection of the intellectual and physical training of the student.

Industrial Education.

The real value of an education to the student depends upon two things: First, the practical worth of the knowledge taught; and, second, the degree in which he makes it his own. Hence, the ability of any institution to give a practical education depends upon the kind and aim of the knowledge it teaches, and upon the thoroughness of the instruction therein. The State Agricultural College was directly endowed by Congress, and is guided by the State, for the specific purpose of furnishing to the industrial classes of Kansas a "practical" education, that is, "one fit for use." As its name indicates, and as the statistics of the industries of the State require, its chief work must be that of giving a useful and usable education to those who will engage in farming; and, therefore, the Farmer's Course must, from the nature of the case, be its main one.

FARMER'S EDUCATION.

Words and figures are merely instruments with which to record ideas. They are not themselves ideas, nor should they be made the chief end of an education. As a wagon is necessary to haul grain, so are they a necessary part of an education; but as the wagon is not the grain, so they are not the knowledge which the farmer converts into money. Hence, the classics and higher mathematics are not taught. But it will be noticed in the following course that so soon as the pupil acquires working skill in the use of the English language as a tool, and of figures and lines as mathematical tools, those arts and sciences which present knowledge that has a cash value to the farmer are taught as rapidly as their importance and thorough acquisition will permit. Studies numbered (1) and (4) in the second, third and fourth years are the spine of the course, to which the others are as ribs and muscle.

FARMER'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Practical Agriculture (advanced.)	1. Physiology.	1. Farm Economy, Special Hygiene.	1. Botany, Entomology.	1. Physiology.	1. Physiology.	1. Drill in English.	1. Drill in English.
2. Geology, Mineralogy.	2. Rhetoric.	2. Geology, Mineralogy.	2. Inorganic Chemistry.	2. Rhetoric.	2. Rhetoric.	2. Drill in Arithmetic.	2. Drill in Arithmetic.
3. Polit. Economy, Practical Law.	3. Algebra.	3. Polit'l Economy, Practical Law.	3. Industrial Drawing.	3. Algebra.	3. Algebra.	3. Industrial Drawing.	3. Industrial Drawing.
4. Zoology.	4. Practical Agricul. (elementary).	4. Zoology.	4. Horticul., Landscape Gardening.	4. English Literature.	4. Practical Agricul. (elementary).	4. English Structure.	4. English Structure.
5. Agricul. Chemistry Meteorology.	5. Physics.	5. Phys'c'l Geography, Meteorology.	5. Organic, Household Chemistry.	5. Physics.	5. Physics.	5. Adv'd Arithmetic, Book-keeping.	5. Adv'd Arith., Book-keeping.
6. Logic.	6. Industrial Drawing.	6. Logic.	6. Household Economy.	6. Industrial Drawing.	6. Industrial Drawing.	6. U.S. History, Industrial Drawing.	6. U.S. History, Industrial Drawing.

WOMAN'S EDUCATION.

Nearly one-half of our students are females, and the Woman's Course is prepared expressly for their liberal and practical education. We have no doubt whatever that practical men and women, who understand what it means and what it seeks to do, will fully endorse it.

WOMAN'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Farm Economy, Special Hygiene.	1. Physiology.	1. Physiology.	1. Botany, Entomology.	1. Physiology.	1. Physiology.	1. Drill in English.	1. Drill in English.
2. Geology, Mineralogy.	2. Rhetoric.	2. Rhetoric.	2. Inorganic Chemistry.	2. Rhetoric.	2. Rhetoric.	2. Drill in Arithmetic.	2. Drill in Arithmetic.
3. Polit'l Economy, Practical Law.	3. Algebra.	3. Algebra.	3. Industrial Drawing.	3. Algebra.	3. Algebra.	3. Industrial Drawing.	3. Industrial Drawing.
4. Zoology.	4. English Literature.	4. English Literature.	4. Horticul., Landscape Gardening.	4. English Literature.	4. English Literature.	4. English Structure.	4. English Structure.
5. Phys'c'l Geography, Meteorology.	5. Physics.	5. Physics.	5. Organic, Household Chemistry.	5. Physics.	5. Physics.	5. Adv'd Arith., Book-keeping.	5. Adv'd Arith., Book-keeping.
6. Logic.	6. Industrial Drawing.	6. Household Economy.	6. Household Economy.	6. Industrial Drawing.	6. Industrial Drawing.	6. U.S. History, Industrial Drawing.	6. U.S. History, Industrial Drawing.

MECHANIC'S EDUCATION.

Because of the adaptedness of the leading course to the wants of the intelligent mechanic, it has been found practically unnecessary to diverge from the Farmer's Course. Additional studies, specially adapted to the mechanic's use, will be furnished in a Post-Graduate's Course.

If it be urged that the distinctively agricultural knowledge taught in the Farmer's Course is not directly valuable to the mechanic, we reply that, admitting the point for the purpose of argument, yet: 1. This knowledge is of more practical value to the mechanic than is the Latin, Greek, or a half dozen other things embraced in the usual course preparatory to the professions; 2. That the great majority of Kansas mechanics will also be more or less engaged in agriculture; 3. That those studies in the course which are directly valuable to the mechanic, together with the shop facilities, offer a better mechanic's education than can be elsewhere found west of the Alleghanies.

INDUSTRIAL DEPARTMENTS.

Having knowledge in the head is one thing; ability to use it with the tongue, fingers or feet is quite another thing. Both are vital to success in practical life. A man might thoroughly understand the theoretical principles of carpentry, and yet, not having used the tools, be wholly unable to earn carpenter's wages. So in all other vocations. Accordingly, instruction is given in the following well-equipped Industrial Departments, and every student is required to recite in some one of them, as selected by the pupil or parent:

FOR MALE STUDENTS.	FOR FEMALE STUDENTS.
The Farm.	Dress-making.
The Nursery.	Printing.
Carpentry.	Telegraphy.
Cabinet-making.	Scroll-sawing.
Turning.	Carving.
Wagon-making.	Engraving.
Painting.	Photography.
Blacksmithing.	Instrumental Music.

Each of these departments is conducted exactly as in daily life, and aims to give precisely the drill received by an apprentice. No charge is made, either for tuition or material, from male students taking the Industrials provided for them; nor from female students taking the ones provided for them, except in Instrumental Music.

THE INDUSTRIALIST.

SATURDAY, MAY 3, 1879.

Prof. Failyer went up to Salina yesterday evening.

The cut-worms are doing more damage to the corn-fields than we have ever before seen in Kansas.

Purcell & Anderson's telephone line from Manhattan to St. George is the longest one in the State.

The old College farm has, in good part, been rented to Mr. Ed Cripps, an old student of the College.

The Short-horns abandoned their winter quarters for the season, and took to "fresh fields and pastures new" yesterday.

Alfalfa plants measuring just two feet in height were cut from the College farm this morning. From the same piece, four heavy crops of hay were taken last year.

In referring to the announcement that Rev. A. C. Peck would preach the sermon to the present graduating class, the Lawrence *Home Journal* says, "The students and public will enjoy a good treat."

Gus Platt, having rented Prof. Lee's farm on the hill, and donned a broad-brimmed hat, has become farmer. He takes hold of work as though he meant to do something, and we predict that he will succeed.

It is worth remembering that one blow of the harrow-tooth will destroy a dozen weeds just as they are coming up. In two months it will require several sharp blows with a hoe to destroy a single weed.

Prof. Failyer reports a total rain-fall of 1½ inches for Tuesday evening and Wednesday morning. Be ye not deceived by these insignificant appearing figures: a rain-fall of one inch is a "soaker" anywhere.

During the month of April the maximum temperature was 78°; and the minimum temperature, 18°. The total rain-fall was 3.21 inches, which is .43 of an inch above the average at this station for the last nineteen years.

The Chemical Department has received from Kinsley, Kansas, a package of river sand supposed to contain gold. On examination, the bright yellow particles proved to be mica. The sand also contained transparent mica.

The class in stock breeding has spent most of its time during the past week in an examination of the College herds. The practice is, to resolve the class into committees, as is done at the fairs, each committee marking upon the "points" of the animal assigned to it.

Mr. A. A. Stewart's attention was yesterday called to the new heading of the *Enterprise*. His only answer was a prolonged pshaw, which we are unable to interpret. In this cold-blooded, brutal fashion, we are cheated out of the materials for a first-rate complimentary local on the *Enterprise's* new heading.

A new form of blanks for School Bonds has been prepared. They were printed by the Kansas Publishing House, Topeka; and it is needless to say that in typography they are "faultless." School Bonds issued upon these blanks are not transferable, and can be sent by mail, at letter postage. The blanks will be furnished free on application to the Loan Commissioner, M. L. Ward.

The following books are missing from the Webster Library: "How to Read Character," "Religion and Science," "Convent Life Unveiled," "Dr. Ox's Experiment," and "The Queen's Favorite." Any person having in his possession any of the above-named books, bearing the mark of the Webster Society, will confer a favor by reporting the same to L. A. Salter, Librarian.

On Saturday last Mr. G. H. Jackson, of Boston, accompanied by J. H. Jackson, of Maple Hill, Wabaunsee county, made a visit to our Institution. The first-named gentleman thinks of engaging in the sheep and cattle business; and has, for the purpose of studying the subject, lately visited Australia and the Pacific coast. He is much pleased with the advantages of our State, and now expects to stay with us. Mr. Jackson was agreeably surprised at the stock which he found on the College farm.

The Alpha Beta Society called to order with President Perry in the chair. After devotion and roll-call, the question of the government distributing the colored people throughout the North and West, was discussed with much spirit. After several warm speeches on each side, the judges decided that it would be an advantage to the government to so distribute them. A declamation entitled, "Industry Necessary for the Orator,' was well rendered by C. C. Chenoweth. The Society appreciates such declamations. Miss Coburn read a very interesting selection entitled, "A Story of Virginia."

In place of the usual extemporaneous speaking, the question of the relative benefits of city and country life was brought forward by Geo. E. Rose, he taking the side of city life. The members took sides according to their feelings on the subject, the majority preferring country life.

The *Gleaner* which was to be read at our next meeting was postponed one week. Question for debate next week, "*Resolved*, That we have gained more knowledge by observation than by reading."

GEO.

ORDER OF COMMENCEMENT EXERCISES.

Sunday, May 18th, sermon to the graduating class, by Rev. A. C. Peck, of Lawrence.

Monday and Tuesday, May 19th and 20th, public examination of classes from 8:40 A. M. to 1 P. M., each day.

Monday evening, May 19th, Under-graduates' Exhibition.

Tuesday evening, Annual Address, by Hon. W. W. Guthrie, of Atchison.

Wednesday evening, Commencement Exercises.

With the exception of the examinations, all these exercises will be held in the Presbyterian Church.

ACKNOWLEDGMENTS.

The Farm acknowledges the receipt of a half bushel of Golden millet seed, from Mr. Frank Leech, of Waterville, Kansas.

Quarterly Report of the Kansas State Board of Agriculture, for the quarter ending March 31st, 1879. This number appears in a more substantial binding than its predecessors, but, like them, is replete with valuable statistical and other information.

The Young Scientist, 176 Broadway, New York. A very useful scientific monthly, designed for amateurs, but really containing much that will interest older heads. We suggest that the *Young Scientist* exchange with the INDUSTRIALIST, and we believe it will pay him to do so.

Bulletin of the American Berkshire Association, Springfield, Ill. No. 1 of this monthly has just been received. As might be inferred from its name, this journal is devoted to the interests of the breeders of Berkshire swine. The number before us contains valuable articles upon swine management and cognate subjects, from which we expect to clip from time to time. The breeders of swine will find it to their advantage to become subscribers to this journal. Address Phil M. Springer, Springfield, Ill.

The last joint meeting of the two societies for the year was held in the hall of the Websters on last Saturday evening. The order of debate was passed, so as to allow ample time for extemporaneous speaking. The members of both societies took an active part, and made the exercise one of the most interesting of the meeting. The present negro exodus received its share of the discussion; and various plans were put forth for distributing them throughout the State in a manner beneficial to themselves and to the commonwealth. The various exercises were interspersed with music, which was rendered in a manner that reflected great credit upon the singers, and also to the committee in charge.

The "Jointed *Reporter* and *Gleaner*" was presented by H. C. Rushmore and Miss Ettie Campbell. As the editor stated in the beginning, it was made up of sixteen joints, numerous half-joints, and one elbow. And we are happy to state that the paper was gotten up in a manner which showed that plenty of "elbow grease" had not been omitted in the make-up of the "articulations;" for the paper evinced care, time and forethought. Owing to the rapidly approaching thunder-shower, part of the paper was omitted, but will probably be read at the next meeting of the Webster Society. Mr. Todd's declamation, "Cataline's Defense," was well delivered. Question for discussion next evening is, "*Resolved*, That a man should not be allowed the right of suffrage until he can read and write." Affirmative, Shartell and Beacham; negative, Myers and Thompson. The *Reporter* will be presented by S. C. Mason.

As we have only three more meetings, it is earnestly desired that every member of the Society should be present at those meetings, as considerable business will have to be done in order to leave the Society in a proper condition for the next-year students.

LEACH.

ENTERPRISE ITEMS.

Strawberry short-cake is in the market.

Jay Gould has granted the negro refugees free passage over the Kansas Pacific.

Mrs. Webber has purchased one of the Goodnow houses on College Hill. Mr. Gist has purchased the Burroughs property.

About three thousand negroes have thus far landed on Kansas soil; and thirty thousand white immigrants have come into the State in the same time. This doesn't look as if the State would be overrun by the colored people yet awhile.

April 21st was "bill day" in Congress and 1,385 bills were introduced, and the clerks were literally snowed under. The Philadelphia *Times* says:

One of the most sensible bills was brought forward by Mr. Anderson of Kansas. By the time his State was reached, this gentleman, tired of the incessant din, sent up to the clerk's desk a bill "for the relief of all other citizens for whom special bills were not introduced to-day and preventing the further introduction of bills." But it didn't have any effect; and it was not until the last State and Territory was called that the flood was stopped.

NATIONALIST ITEMS.

The re-opening of the Christian Church will take place on next Lord's day.

During five days of last week E. B. Purcell shipped 5,915 dozen eggs. That will do for one house.

Mrs. Judge Pipher has let the contract for a fine brick dwelling on the corner of Fifth and Pierre streets.

Geo. F. Brown is building a one and a half story frame residence, 24x24 feet, on the corner of Second and Freemont streets.

Nearly all of the colored people who came to Manhattan about ten days ago, have secured places, and no longer need assistance.

George W. Higinbotham has purchased the old paper mill, together with the five acres of land on which it is situated, for $1,800.

The ladies of the Episcopal Church have been preparing for a Fair, to be held Thursday and Friday evening of the next week.

Judge Pipher is erecting a two-story addition to the post-office building, the upper part of which will be occupied by Horace Buel as a photograph gallery.

At last we are able to say to our readers that it is probable the Manhattan & Northwestern Railway will be completed and put in operation this year. The full particulars we are not at liberty to state yet, but hope to in a week or two.

The *Nationalist* has a larger circulation in Manhattan than any other paper, a larger circulation in Riley county than any other paper, and a larger circulation in western Pottawatomie county than any paper published outside of that county.

Hon. E. B. Reynolds writes that he will speak on temperance, in Manhattan, Monday and Tuesday nights, May 12th and 13th; and at St. Marys, Wednesday, the 14th. Mr. Reynolds is now on his way home, and we trust that he will have a warm reception.

The Manhattan Guards had an outdoor drill on Wednesday evening, and startled folks not a little by discharging about a half a dozen rounds of blank cartridges. The action was in concert and good order, and dire will be the consequences to all foes who come within range of those rifles.

There was a telephone concert Wednesday night over Purcell & Anderson's line. At this place about one hundred people assembled in the room above Mr. Purcell's counting-room, and listened to music by the Manhattan String Band, played for the benefit of St. George, and also to music and singing in St. George, besides talking with the people there. To most of those assembled, it was a great novelty, and was very much enjoyed. J. T. Ritchie was master of ceremonies, and made everybody feel at home.

The INDUSTRIALIST, from the Printing Department of the Kansas State Agricultural College, E. M. Shelton, editor, is true to its name. Its weekly regularity, well-written and well-selected articles, with its bonmots and College information, make it a welcome visitor.—*Orphan's Friend.*

DIRECTIONS TO APPLICANTS.

TERMS OF ADMISSION.

Candidates for admission must be fourteen years of age, and pass a satisfactory examination in reading; arithmetic, through decimal fractions; and English grammar, to syntax. Classes are started at the beginning of each year in Drill in Arithmetic and Drill in English; and the pupil must have the knowledge above indicated, else he will be unable to retain position if admitted.

Pupils will be received at any time during the year, if able to pass an additional examination upon the subjects studied by the classes which they expect to enter. But they will find it greatly to their advantage to be present at the opening of each term, or as soon thereafter as posssble.

GRADES.

Both the Literary and Industrial recitations are graded daily upon a scale of 100; and an examination of all classes is made at the close of each month. A student not attaining an average grade of sixty is promptly dropped to a lower class, or excluded from the Institution until able to do so. The work of grading is strict and uniform in all the departments, and this process is rigorously used for sifting out incompetent and indolent pupils; thus more than accomplishing all that is designed to be effected by a "high standard of admission." Hence, the student's continuance in the College wholly depends upon his own action.

The course is based upon the determination to make the labor required in the preparation of one industrial and three literary recitations as much as the average student can perfectly perform, in ten hours a day. We design to give the pupil the worth of the time expended at College; and, in order thereto, he must do a full day's work with brain or hand. Only those students who can maintain a standing of ninety in each study will be allowed to take more than the prescribed number of recitations; and no one will be permitted to have less than one industrial and three literary recitations.

RELIGIOUS.

Unless otherwise directed by parents, students are required to attend chapel at 8:30 A. M. on academic days, and divine service once every Sabbath.

EXPENSES.

There are no charges whatever for enrollment, attendance or instruction in the regular courses; nor are there any "contingent fees" for the repair of buildings, for the use of books or apparatus, for diplomas, or the kindred privileges usually grouped under the term "contingent." Male students are furnished instruction, the use of apparatus, instruments or tools, in both the literary and industrial classes marked out for them, without any charge. And the same is true of female students in the regular classes provided for them. Printing and Telegraphy are industrials primarily provided for the education of female students, and male students taking either of these are charged $1 per month for use of instruments.

Instrumental music is a fine art or "accomplishment," rather than a mechanical art. We do not place it among our "industrials" in the same sense, or for the same purpose, that we do those provided for teaching the trades. Accordingly, a fee of $12 per term, or seventy-five cents per week is required from female students for tuition and the use of pianos or organs.

The only charge made for material in either the literary or industrial departments is for the chemicals used by students in laboratory practice, which are furnished at wholesale prices, and amount to but a small sum.

Furnishing an absolutely free education is as much as can be reasonably asked; and the Institution neither boards, clothes, nor supplies the student with text-books. Boarding can be obtained in private families at from $2.75 to $4 per week. Washing costs from seventy-five cents to one dollar per dozen. Text-books, which can be procured in Manhattan, cost from $2 to $5 per term.

No student need expend over $5 per week; and many of our best pupils are living at $1.25 per week. Students desiring to "board themselves" can do so at from $1 to $2 per week. In a club of four young men, renting a house, the average cost to each for the term was $1.11 per week.

AMOUNT EARNED.

It is impossible to predict how much a given person can earn, since that depends upon what he can do and what work there is to be done. Hence, it is wholly impossible for us to answer the question so often asked: "Do you think I can meet my expenses by work?" Some students make one-half their expenses, some the whole, and exceptional men have made more than expenses. As a rule, a faithful boy skilled in farm work can earn half his expenses on the Farm or in the Nursery. During the year he can ordinarily acquire sufficient skill in the wood or iron shops to enable him to make articles for sale. The whole question is one for his own consideration and decision. We can teach all who come, but cannot absolutely *promise* anything more. Hitherto we have refrained from holding out strong inducements respecting the amount of labor we might have to offer; but in view of the fact that during each of the last three years we have had more to do than the students could perform, we are inclined to give greater and positive encouragement on this point. Any boy who is in dead earnest, who is familiar with farm operations, and who can raise $50 to start with, should be able to carry himself through the four years' course. And certainly this places an education within the reach of every determined boy. As yet we are unable to offer similar advantages to girls, not requiring labor in the College departments which they can perform.

RULES.

1. Behave as a true man or woman should, at all times and in all places.

2. Attend to your own business promptly, thoroughly and courteously; and vigorously let alone that of other people.

3. Penalty: "Leave!"

THE INDUSTRIALIST.

SATURDAY, MAY 3, 1879.

DEPARTMENTS OF INSTRUCTION.

DEPARTMENT OF AGRICULTURE.

PRACTICAL AGRICULTURE.

Second Year:—General principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage.

Fourth Year: General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of a rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farm-houses; barns.

FARM ECONOMY.

Woman's Course, Fourth Year: Dairy products as human food; influences affecting character of milk; manufacture of condensed milk; the factory system and household plan of cheese-making; treatment of rennet; general process of cheese manufacture; subsequent treatment of cheese; butter-making; creameries; "deep" and "shallow" setting systems; general process of butter-making; packing and preserving butter.

DEPARTMENT OF BOTANY AND PRACTICAL HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest; also a course of lectures on Landscape Gardening. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard; fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture; shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in in the work of laying out and plotting grounds topographically.

CHEMICAL DEPARTMENT.

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life. Text-book, Ganot.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blow-pipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

Are constantly in progress in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

DRILL IN ENGLISH.

"As grammar was made after language, so ought it to be taught after language."—*Herbert Spencer.*

Drill in English embraces the following topics:

Sounds of the language; drill in producing the vocal, sub-vocal and aspirate elements with accuracy, distinctness and volume; vowels, consonants.

Letters: Form; power; rules for spelling, drill.

Words: Signification, properties, modifications, variations, relation and dependence.

Sentences: Drill in statement of ideas; description, clearness, terseness, vigor; business letters, discussion; capitalization; syllabication; punctuation; construction and analysis of sentences; elements, uses and names; criticism of compositions printed as written; proof reading; grammatical construction; superfluous words and clauses; drill in reading, speaking and penmanship.

Text-books: Webster's Academic Dictionary; Lee & Hadley's Advanced Lessons in Language.

Pupils deficient in spelling, etc., should enter the printing class, the printing-office being the work-shop of language.

STRUCTURE OF ENGLISH.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

MATHEMATICAL DEPARTMENT.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

DRILL IN ARITHMETIC.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Following this line, the student, so far from hammering away at "pure" science draws from the mathematical store-house what he needs, and sees why he needs it. Accuracy of calculation and posting, rather than a *mere* comprehension of the principles, is aimed at. Besides the recitation-room drill in business forms, practice in the field is also given. Estimating the number of cords in a pile of wood said to be 100x4x4 feet is one thing; measuring a pile of wood through which any number of cats may be harmlessly thrown, and in which four-feet sticks are the exception, is quite another and more difficult thing.

ARITHMETIC AND BOOK-KEEPING

Is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides ensuring arithmetical practice, develops practical skill in that important art.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admiral system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study. In addition, constant practice in the application of lines to metal and wood is furnished in the Blacksmith, Carpenter, Turning, Scroll-sawing, Carving, Engraving and Printing shops, and to fabrics in the Sewing Department.

PRACTICAL GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the use of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

PRACTICAL SURVEYING.

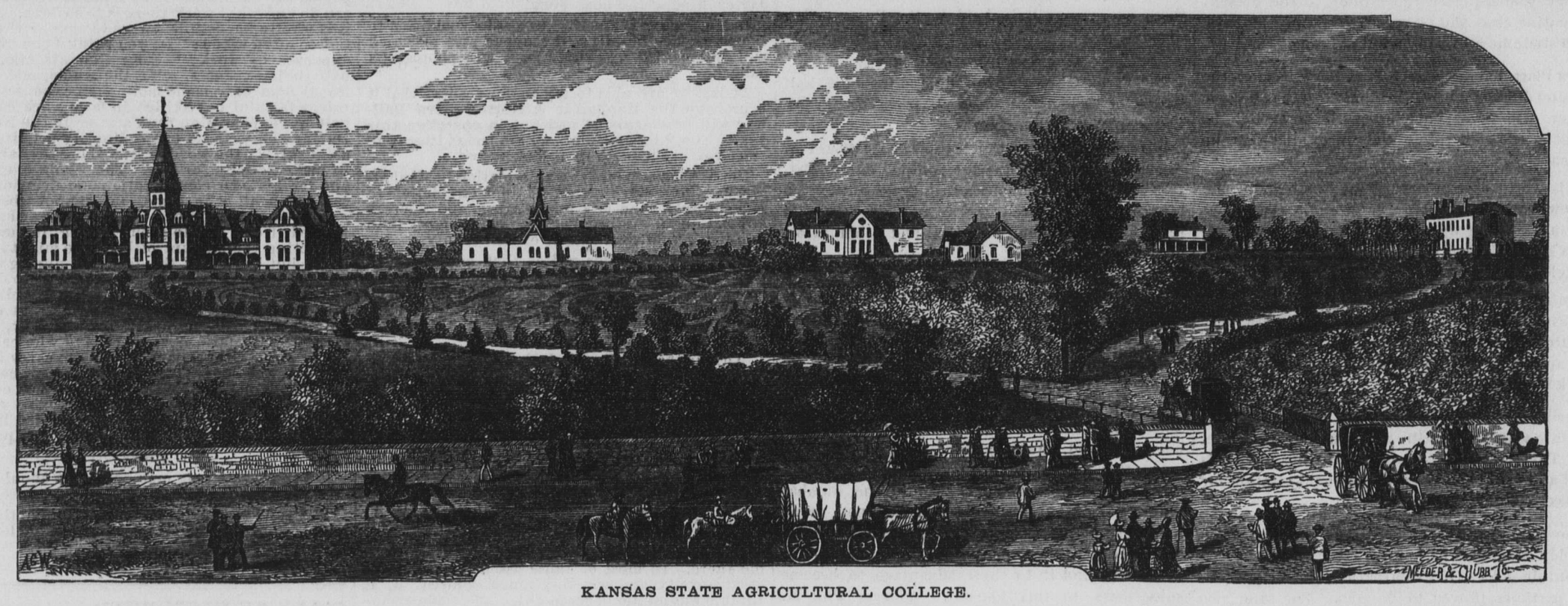
The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

STUDIES SPECIAL TO WOMAN.

FARM ECONOMY considers those affairs of the farm which usually come under the supervision of the farmer's wife or daughter, and which are not included in "gardening" or "household economy;" such as butter and cheese-making, dairy management, etc. A course of lectures is delivered by the Professor of Practical Agriculture. See heading, "Farm Economy."

GARDENING is included in Practical Horticulture. See heading, "Landscape Gardening."

HOUSEHOLD CHEMISTRY. See heading, "Household Chemistry."



KANSAS STATE AGRICULTURAL COLLEGE.

At first glance there appears a striking contrast in the two cuts of the College that appear in the INDUSTRIALIST. A slight examination, however, will show that the difference is due wholly to the principle of "perspective," applied to both space and time. In this cut the point of observation is outside of the College grounds, about six hundred yards from the line of the buildings; in time, the perspective is about three years from date.

This picture shows the plan upon which the improvements have been made during the last four years. The right wing of the main building has been erected, and is already occupied. It will cost about $50,000 to make the representation of the buildings and grounds in the cut a reality; and we confidently expect that sum of money will be appropriated by the next Legislature of Kansas.

But no adequate conception of an institution of learning can be obtained by a view of its buildings and grounds. We wish it were possible to present to our readers an interior view of the Agricultural College,—the good, honest work daily done in shop, office and class-room; the groups of earnest, thoughtful, sensible young men and women, as they now are, and what they will become two or three years hence, under the vigorous discipline of our industrial course of study.

THE INDUSTRIALIST

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THE INDUSTRIALIST.

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What We Know and What We Want.

We know that agriculture, as an occupation, whether followed for health, pleasure, moral influence, sincerity, independence or respectability, will not suffer in comparison with any other employment in which men are engaged. We know that no occupation is so well fitted to strengthen and invigorate the frame and constitution as exercise in the open air; or better calculated to maintain health, promote long life, or ward off the ravages of disease. We know, also, that the exceptions to this general statement are caused by our own carelessness of the laws of health. We know that if when heated we permit ourselves to cool off quickly, and check perspiration too suddenly, rheumatism, in the form of sciatic or facial neuralgia, will result. We know that if our open-walled wells are located so as to receive the drainage from the kitchen, or worse still the filthy vault, typhoid fever, diphtheria, and many other fatal forms of disease will foreclose their mortgage on us at once. We know that the farmer is assailed by fewer temptations to vicious indulgence than the laborers of other occupations. We know that farm life, as a rule, is productive of mental quietude and enjoyment. We know that furnishing as we do sustenance and the materials upon which those following other occupations, the manufacturing and commercial classes, exert their industry, we seem to originate everything; and are, to all intents and purposes, as independent of those engaged in other pursuits as it is apparently possible to be.

What we want to know is what we *don't know* concerning our occupation and ourselves. We don't care for elaborate theories, but we *do* want *facts* based on the experience of those who, without the possession of unlimited capital, or indeed more than the average farmer possesses, have made the farm pay. Hereafter we want to condense the grain crop, and sell more on hoof and in fleece. We want the head educated to direct the hand. We want to see smaller farms, better tillage, and more under-drains in all our heavy clay soils. We want to keep accurate and reliable accounts, so as to know whether we are farming for our own profit or that of some one else. We want to understand better the principles involved in all our agricultural operations. If we can, as Lavoisier, of France, did, double the crops on his domain, and quadruple his profits by "scientific farming," then we want more applied science in our pursuit. We want to see a monthly record of "farm facts" kept in every grange, and to see a living grange in every township; and we want to see each member thereof strive to excel, not only in quality, but the quantity of each product raised or manufactured for the market. We want to see more object teaching done in our common schools. Also, enough of botany to enable our boys and girls to name the various grapes native to the soil, and the various forest trees, shrubs, plants and flowers; and entomology sufficient to enable them to discriminate between the noxious and beneficial insects, so that these branches of knowledge can be utilized in the every-day affairs of life. We want to see the name "Ohio Agricultural College" restored, or the word "Industrial" inserted before the word University, so that the name at least will imply that the provisions of the of Congress, July 2d, 1862, entitled, "An act donating public lands to the several States and Territories which may provide *colleges* for the benefit of agriculture and the mechanic arts,"— are being carried out. If the institution created under this act, now known as the State Untversity, has a new name as often as it is deemed desirable, we want to see it an agricultural and mechanical, and not a literary college, in the sense in which the Senators regarded the word when the merits of the act were being discussed. Senator Morrill, the one who framed the act, in an impressive speech, used the following significant words:

"The *farmer* and the *mechanic* require *special schools* and *appropriate literature*, quite as much as any of the so-called *learned* professions." No one claimed at the time of the passage of this act that the learned professions of the University were to form a part of the Agricultural College instruction. What we want is the provisions of the law, as understood by those who favored and those who opposed its passage, faithfully carried out. The citizens of California understood the purpose of the law, for they forwarded petitions and instructed Senator Gwin, of that State, to "oppose the bill for the endowment of a college to be devoted to instruction in such branches of education as pertain to *agriculture, mechanic arts, and natural history.*" Senator Harlan, in defense of the same act, understood the object of the creation of such a college to be "simply a proposition to take a fraction of the public lands to aid the farmers of the country in educating their sons, or those of them who choose to give them a *scientific agricultural education.*" We want our rights in this matter, and the legislators of this State or any other ought to respect them.—*Cincinnati Grange Bulletin.*

Lighter Bacon.

Previous to a short time ago, it was deemed essential by breeders of both cattle and hogs to get as much weight and fat as possible, to the almost utter neglect of symmetry and style. In fact, when the exportation of live cattle to England and other foreign countries began, agents here showed a decided preference for large-framed, "old-fashioned" fat cattle averaging 1,700 lbs. and over, regardless of shape and fineness of bone. This is accounted for, however, by the fact that in the infancy of the trade,—or rather in its first stage, as it is still in its infancy, as it were,—ocean freight rates were so much per head; and it is readily understood that it was to exporters' interests to ship as much weight to the number of head as possible. As the trade increased in volume the system was changed, and exporters were charged so much per 100 lbs., the same as any other class of freight, thereby lessening the demand for coarse, unevenly fatted, heavy cattle, and naturally increasing the inquiry for well-bred, symmetrical animals of lighter weight.

The change in the course of the hog trade has been as radical as in cattle, although it cannot be attributed, except in a small degree, to the same cause, as the exportation of live hogs to foreign countries is indeed in its infancy; yet the volume of traffic is rapidly increasing, and thus far has proved highly remunerative to those interested. But a notable fact, and one worthy of the special attention of breeders and raisers of hogs, is that light, evenly fatted, and fine-boned swine, averaging a little over 200 lbs. in weight, is the only grade of our hogs that has proved satisfactory to our British cousins; and heavier weights do not stand the long journey and confinement on shipboard as well as stock of lighter weight and less fat.

There are several English houses here, as most of our readers well know, that are almost exclusively engaged in the curing and shipping of English cuts; and, as is generally a well-known fact, to meet the requirements of this trade, hogs must not be too fat, but compact and well bred.—*Drovers' Journal.*

GENIUS is not a quality of idle, lazy men.

The Famous Whiting Ranch.

On Saturday last, in company with F. L. Richter, deputy sheriff, we enjoyed a drive out to the valleys of Diamond and Six Mile Creeks; and visited the now famous Whiting ranch, where we were agreeably surprised by meeting the Major, who had arrived from his Illinois home only a few evenings previous. We have had frequent occasion, during the past year, to speak of the wonderful improvements which Major Whiting was making on this Diamond Springs property; but as the Major's plans begin to develop, there is no lack of something new to be said concerning them. One will travel far in Kansas, or any other State, before he will find a like number of acres enclosed with as fine a stone wall as surrounds the Whiting ranch. This wall encloses a tract three miles long by two wide, making a continuous line of ten miles of stone, with numerous cross fences, of equal proportion, which swell the aggregate five or more miles.

Within this system of enclosures there is sufficient land to graze 1,500 head of stock, and give each animal plenty of "sea room." One of the Major's small improvements is a sixty-acre hog lot, sown in tame grasses. And, by the way, it will pay some of our small farmers to watch the experiments now being conducted at the ranch, in the growing of the tame grasses. All the varieties are being tried under various conditions; alfalfa, timothy, clover and blue-grass being the principal varieties used.

Major Whiting has unbounded faith in Kansas, tempered by an abundance of practical, solid sense. All of his plans are being carried out with a definite object in view; and the country, location and condition have been taken careful account of: so that any skeptical individuals who are looking upon the Major's Diamond Springs investment as a precarious speculation, may as well dismiss all anxiety; for the owner is perfectly aware of what he is doing.

While at the ranch we saw a bed of water-cress (*Nasturtium officinale*), which plant is one of the best early salads and anti-scorbutics that can be used. The plant is not common in Kansas, and we doubt if it can be found elsewhere in the county. This came from a small bunch which the Major brought from Illinois and placed in the spring. The Major's estimate of the value of the bed we saw, if on the market in any city, was $200. Of course, Morris county will be overrun with water-cress in less than two years. People can get it easily, as it is given away at the ranch to all who ask.—*Council Grove Republican.*

Succession of Garden Vegetables.

Many persons plant all their garden seeds at one time. It is not the right way. It gives one "a feast or a famine." Take green peas. There should be enough planted to give the family a supply while they are in season for eating, which is about two weeks. When that season is over, a new supply should be coming on, fresh and tender, to last two weeks longer; and when they are gone, another supply should be coming on; and thus continuing all summer. The same should be the case with green corn and many other table vegetables. By planting garden seeds every two weeks throughout the spring and early summer, nice, fresh vegetables may be put on the table every day. It is true, it takes a little more labor and care and watchfulness to do all this, but then it pays. Farmers and their wives and their boys and girls work hard, have hearty appetites, deserve good things to eat, and they can have them and enjoy them, if they wish to. But it takes a little more work.—*Coleman's Rural World.*

THE INDUSTRIALIST.

SATURDAY, MAY 10, 1879.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

Kentucky Blue-Grass.

This is one of the commonest and best known of the pasture grasses; and in the West, and especially in the southwest, it is without a rival in the popular estimation. In our own State it has already secured a firm footing, as far west at least as the center of the State; and there are few in this section who question the possibility of growing blue-grass in Kansas. In this vicinity as fine swards may be seen as can be found anywhere; while dotting the wild prairies in all directions, little colonies of this same grass are rapidly occupying the land.

Our own opinion of Kentucky blue-grass is, that it is vastly overestimated. We have a considerable area upon the College farm occupied by this grass; and our disgust at its performance increases from year to year. Of course, for lawn purposes blue-grass is unequaled; but for the farmer's uses, while on account of its staying power it is greatly superior to the wild grasses, it is inferior to many of the common, cultivated sorts; notably, orchard-grass, alfalfa, or even perennial rye-grass.

The objections to blue-grass are not a few, the principal being: It is slow in forming a sod, requiring a number of years for this purpose; and consequently it is useless for alternate husbandry. The grass itself is poor and wiry; and, except during early spring and late fall, cattle will not eat it, unless they are driven to it. Our custom has been to sow several kinds of grass in each field; and invariably we find that the blue-grass remains untouched until the other sorts are consumed. Moreover, the amount of feed per acre furnished by this grass is small,—much less than is furnished by clover, alfalfa, or even orchard or perennial rye-grass. We can easily see that, for a mild, moist climate, in a region largely pastoral, like Kentucky, blue-grass is very valuable as a winter pasture; but, in our own State, and with farmers who wish to make the most of their acres, it is very far from being the best of the tame grasses.

We write all this after a good deal of experience with blue-grass; and we have about come to the conclusion that, except for mixing slightly with other sorts, we have sown the last blue-grass seed.—*Prof. Shelton.*

The Rose.

This charming flower is very properly called the "queen of flowers." For many centuries it has held this high rank. It is native in many parts of the world, and lives to great age. There are some plants of the rose which are so large as to deserve the name of trees. There is one in Florida which is nearly twenty feet high, and has a trunk over six inches in diameter. It is about one hundred years old, and bears many thousands of flowers every year.

The rose is thus highly esteemed for the following reasons: The beauty of its flowers is exquisite because of their varied colors, which range from pure white to almost black. All imaginable shades and tints of yellow, pink, rose, red, crimson and purple may be found, but none that are blue. The variety of size and form is also very great. Some are not more than half an inch across, and others quite five inches. Some are single and some are double. The sweet perfume of the rose attracts every one. Another thing is, that it will grow in almost any soil with ordinary care. There is hardly a home in America, worth calling such, that does not have at least some common rose-bush. Even the wild roses adorn the fence-corners, and cast their fragrance upon the air, perhaps only to be enjoyed by the passing traveler or the wild Indian maiden.

Although the rose will bear neglect in meekness, yet it flourishes best in a rich, loose soil, if not wet or clammy. Do not fear to apply well-rotted manure, and dig a foot or more deep. Such treatment before planting, or to old bushes already seeming to fail, will repay you for the work by vigorous growth and a profusion of bloom. If the soil about the bushes is kept loose by digging or cultivating through the growing season, still better results will be reached. Little pruning is necessary, except enough to keep the dead branches cut away. The rose family has several divisions.

The most desirable of these is that class known as Hybrid Perpetuals. By some they are called Remontants, which means blooming again. This is perhaps a better term; for this class does not really bloom perpetually, even during the summer, but blooms freely during the common rose season, which is usually in May and June, and then again in the fall. Now and then a flower will appear during the summer; but, if cut back a little just after the early blooming is over and well cultivated, considerable bloom is often obtained, even in the drier and hotter months. Most of the varieties of this class are hardy outdoors in this climate, especially if slightly protected during the winter. They are of bushy habit, and do very well grown in masses or alone, as pleases the fancy. None of them are yellow; but all shades of white, pink, red and purple may be had. Some are fragrant and some are not. John Hopper, Baron Prevost, and Gen. Jaqueminot are some of the best of this class, and are known by many people.

Moss roses form another class. They are so called from the great abundance of small prickles on the branches, and fine, hair-like appendages to the calyx or covering of the flower-buds, which gives them a mossy appearance. They are all very hardy, and give much satisfaction.

Climbing roses are also very desirable, and easily grown. Nothing is prettier for covering a veranda, or twining about a window. Prairie Queen is perhaps the best of these.

China or Bengal roses are dwarfish in habit, and great bloomers all the summer and fall. The bloom is not very large or fragrant. The prevailing colors are dark; none are yellow. Because of the dwarfish growth, they make fine house-plants. The green rose belongs to this class.

Tea roses comprise another class. They are widely known for their delicious fragrance, which resembles that of the tea-plant. None have more delicate colors, which are mostly yellow, white or pink, with all imaginable grades between them. The flowers are often large, and beautifully formed. All the tea roses are tender in this climate; and must be securely covered in winter, so as not to freeze, or be taken indoors. A good way is to use the 'basket' plan. Plant in a wire basket sunk in the open ground; and in the fall, by cutting off a few straggling roots, a ball of earth inside the basket, with most of the roots, may be taken up and kept in the cellar, and in spring planted out again. By putting this inside a larger basket as the growth of roots demands it, very large bushes may be safely moved in this way from year to year. The Marechal Niel is one of this class, but is of a climbing habit.

Bourbon roses constitute another class, which is almost hardy in this climate. A little winter protection will secure it against injury. The colors range from nearly white to crimson, except yellow. Most of its varieties bloom constantly during summer and autumn. Hermosa is one of the best Bourbons in cultivation.

Noisette roses are beautiful, perpetual bloomers, and usually of a yellow color. They are very tender, and will only do to be left outdoors in winter in the southern States. They are climbers, and are very fine for house culture.

All these kinds of roses are for sale by the best nurserymen of the country. Leeds & Co., of Richmond, Ind., are perhaps the best and most accessible of rose-growers for the West. They are entirely reliable, and sell at very moderate prices. Let any who wish to plant this sweetest of flowers, send to them for a catalogue, and choose from their large collection such as will suit the fancy. They will be sent by mail to any post-office.—*Prof. VanDeman.*

Miles' Stock Breeding.

Some months ago we reviewed the above work in these columns, and since then have used it with excellent success in the class-room. As the book has had a considerable sale in this State, it will doubtless interest many of our readers to know what the newspapers of the country think of this latest addition to our agricultural literature. We clip the following from the Lansing (Mich.) *Republican:*

The press contains many complimentary notices of Dr. Manly Miles' new work on "Stock Breeding." The New York *Evening Post*, a paper usually backward in bestowing praise, says: "The work is scientific in a double sense: it is an application of a scientific law to practice; and its conclusions are founded upon the most careful inductive reasoning, from a vast collection of facts." The Chicago *Times*, in an extended notice, says: "No man in the country possesses better requirements for writing a comprehensive, scientific and practical work on stock breeding than Prof. Miles. His studies as a physician, his observations as a naturalist, his experience as a breeder of stock, his studies while professor of agriculture, his knowledge acquired in travel, all helped qualify him for the work he undertook." That journal further says: "As a compendium of what is known as stock breeding, it is doubtless superior to any work of the size ever written. It is deserving of being adopted as a text-book in every agricultural college, and is worthy of a place in the library of every stock-breeder in the country." The New York *Graphic* says: "We have no hesitation in recommending this work as the most comprehensive and learned treatise on the subject of stock breeding that has yet made its appearance. It is not only a valuable work for those for whom it was specially intended, but will be read with interest by all who are interested in biological studies." These are but a few of the flattering notices received by Dr. Miles for his useful contribution to agricultural literature, and every word of praise bestowed is justly deserved.

Industrial Education.

The real value of an education to the student depends upon two things: First, the practical worth of the knowledge taught; and, second, the degree in which he makes it his own. Hence, the ability of any institution to give a practical education depends upon the kind and aim of the knowledge it teaches, and upon the thoroughness of the instruction therein. The State Agricultural College was directly endowed by Congress, and is guided by the State, for the specific purpose of furnishing to the industrial classes of Kansas a "practical" education, that is, "one fit for use." As its name indicates, and as the statistics of the industries of the State require, its chief work must be that of giving a useful and usable education to those who will engage in farming; and, therefore, the Farmer's Course must, from the nature of the case, be its main one.

FARMER'S EDUCATION.

Words and figures are merely instruments with which to record ideas. They are not themselves ideas, nor should they be made the chief end of an education. As a wagon is necessary to haul grain, so are they a necessary part of an education; but as the wagon is not the grain, so they are not the knowledge which the farmer converts into money. Hence, the classics and higher mathematics are not taught. But it will be noticed in the following course that so soon as the pupil acquires working skill in the use of the English language as a tool, and of figures and lines as mathematical tools, those arts and sciences which present knowledge that has a cash value to the farmer are taught as rapidly as their importance and thorough acquisition will permit. Studies numbered (1) and (4) in the second, third and fourth years are the spine of the course, to which the others are as ribs and muscle.

FARMER'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Practical Agriculture (advanced.)	1. Botany, Entomology.	1. Botany, Entomology.	1. Physiology.	1. Physiology.	1. Drill in English.		
2. Geology, Mineralogy.	2. Inorganic Chemistry.	2. Inorganic Chemistry.	2. Rhetoric.	2. Rhetoric.	2. Drill in Arithmetic.		
3. Polit. Economy, Practical Law.	3. Practical Geometry.	3. Industrial Drawing.	3. Algebra.	3. Algebra.	3. Industrial Drawing.		
4. Zoology.	4. Horticul., Landscape Gardening.	4. Horticul., Landscape Gardening.	4. Practical Agricul. (elementary).	4. Practical Agricul. (elementary).	4. English Structure.		
5. Agricul. Chemistry Meteorology.	5. Organic, Analytical Chemistry.	5. Organic, Analytical Chemistry.	5. Physics.	5. Physics.	5. Adv'd Arithmetic, Book-keeping.		
6. Logic.	6. Practical Surveying.	6. Practical Surveying.	6. Industrial Drawing.	6. Industrial Drawing.	6. U.S. History, Industrial Drawing.		

WOMAN'S EDUCATION.

Nearly one-half of our students are females, and the Woman's Course is prepared expressly for their liberal and practical education. We have no doubt whatever that practical men and women, who understand what it means and what it seeks to do, will fully endorse it.

WOMAN'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Farm Economy, Special Hygiene.	1. Botany, Entomology.	1. Botany, Entomology.	1. Physiology.	1. Physiology.	1. Drill in English.		
2. Geology, Mineralogy.	2. Inorganic Chemistry.	2. Inorganic Chemistry.	2. Rhetoric.	2. Rhetoric.	2. Drill in Arithmetic.		
3. Polit'l Economy, Practical Law.	3. Industrial Drawing.	3. Industrial Drawing.	3. Algebra.	3. Algebra.	3. Industrial Drawing.		
4. Zoology.	4. English Literature.	4. Horticul., Landscape Gardening.	4. English Literature.	4. English Literature.	4. English Structure.		
5. Physic'l Geography, Meteorology.	5. Organic, Household Chemistry.	5. Organic, Household Chemistry.	5. Physics.	5. Physics.	5. Adv'd Arith., Book-keeping.		
6. Logic.	6. Household Economy.	6. Household Economy.	6. Industrial Drawing.	6. Industrial Drawing.	6. U.S. History, Industrial Drawing.		

MECHANIC'S EDUCATION.

Because of the adaptedness of the leading course to the wants of the intelligent mechanic, it has been found practically unnecessary to diverge from the Farmer's Course. Additional studies, specially adapted to the mechanic's use, will be furnished in a Post-Graduate's Course.

If it be urged that the distinctively agricultural knowledge taught in the Farmer's Course is not directly valuable to the mechanic, we reply that, admitting the point for the purpose of argument, yet: 1. This knowledge is of more practical value to the mechanic than is the Latin, Greek, or a half dozen other things embraced in the usual course preparatory to the professions; 2. That the great majority of Kansas mechanics will also be more or less engaged in agriculture; 3. That those studies in the course which are directly valuable to the mechanic, together with the shop facilities, offer a better mechanic's education than can be elsewhere found west of the Alleghanies.

INDUSTRIAL DEPARTMENTS.

Having knowledge in the head is one thing; ability to use it with the tongue, fingers or feet is quite another thing. Both are vital to success in practical life. A man might thoroughly understand the theoretical principles of carpentry, and yet, not having used the tools, be wholly unable to earn carpenter's wages. So in all other vocations. Accordingly, instruction is given in the following well-equipped Industrial Departments, and every student is required to recite in some one of them, as selected by the pupil or parent:

FOR MALE STUDENTS.	FOR FEMALE STUDENTS.
The Farm.	Dress-making.
The Nursery.	Printing.
Carpentry.	Telegraphy.
Cabinet-making.	Scroll-sawing.
Turning.	Carving.
Wagon-making.	Engraving.
Painting.	Photography.
Blacksmithing.	Instrumental Music.

Each of these departments is conducted exactly as in daily life, and aims to give precisely the drill received by an apprentice. No charge is made, either for tuition or material, from male students taking the Industrials provided for them; nor from female students taking the ones provided for them, except in Instrumental Music.

THE INDUSTRIALIST.

SATURDAY, MAY 10, 1879.

The Seniors just now are in all the agonies of composition.

See advertisements of Short-horns and Berkshires for sale.

A letter from Rev. H. I. Coe is crowded over until next week.

The general review of the work of the term in all the different classes was begun some time since.

In our last issue we omitted to mention that our new cut is a copy of an illustration in the Kansas Edition of the Eclectic School Geography, published by VanAntwerp, Bragg & Co., Cincinnati.

The Seniors and their friends were entertained at the home of Prof. Ward on Thursday eve of this week. The unanimous report of the favored ones is that they were most hospitably entertained by the Professor and his estimable lady.

Two weeks ago thirty good-sized shoats were quartered upon three acres of ground which is about equally seeded to alfalfa and clover. At this writing the grass has gained upon the pigs, and the pigs have gained amazingly. This is our way of solving the problem of how to raise cheap pork.

The *Kansas Monthly* for April is received. This very neat monthly is full of information concerning our favored State; and for those who desire to give their eastern friends an idea of the appearance and resources of Kansas, no better paper is printed. Price, $1.50. Address J. S. Boughton, publisher, Lawrence, Kansas.

On Saturday last we had a pleasant visit from Mr. Hallowell, the Superintendent of the celebrated Durham Park herd of Short-horns, and Mr. Wm. Watson, of Junction City, whose name is familiar to readers of this paper. These gentlemen seemed much pleased with the workings of our Agricultural College; and both were very outspoken in their commendation of the College herds.

The *Western Homestead*, W. S. Burke, publisher, Leavenworth, Kansas. The concluding number of Vol. I. is just now at hand. It will give pleasure to the many friends of this excellent family magazine to receive the assurance contained in this number, that "it has paid all of its own expenses during the first year." This being true, there can be no doubt that there is a place for the *Homestead*. That this place has been very ably filled, every one of its readers will bear testimony.

Some of the members of the Alpha Beta Society have been endeavoring to analyze and define the word *progredimur*, which is a part of the Society motto, and the signature of its reporter. Here is the result of the last attempt: *Prog-re-di-mur.*—*Prog* means to hook or steal; *re* means again, that is, hook again; *di* means twice: and so far the word means to *hook again twice*. *Mur* could not be analyzed. After one week of prodigious thought and labor, it was decided that *mur* might mean watermelons, or possibly peaches!

We have on hand some bound volumes of the INDUSTRIALIST, which we will sell at the following figures: Vol. II., from April 15, 1876, to April 14, 1877, $1.00; first half of Vol. III., from April 14, 1877, to Oct. 6, 1877, fifty cents; second half of Vol. III., and Vol. IV., from Oct. 6, 1877, to April 12, 1879, $1.50. These figures do not include postage. Persons desiring to purchase any of the above, should order immediately, as we have but few copies. Old students will find these bound volumes of the INDUSTRIALIST especially interesting and valuable. Address A. A. Stewart, Manhattan, Kansas.

The letter given below is a sample of many that are received at the College:

B——, Aargau, Switzerland, 20 April, '79.

Much respected and highly honorable Mr. General Governor and President of the Kansas State Agricultural School:

The undersigned takes the liberty to ask if cheap land, suitable for cheese-making, could be had in eastern Kansas. I want to buy some 300 acres or more, and would prefer some buildings on it. I do not want swamps. I am a cheese-maker, and want the land for that purpose. Can large kettles and other cheese implements be had over there, or will I have to bring them along? Expecting an early answer, I am

Yours Respectfully, J. B., Ex-Councilman.

The Alpha Beta Society called to order with the Vice-President in the chair. Prayer by A. T. Blain. The weather being unfavorable, the attendance was small. The question, "*Resolved*, That man receives more knowledge by observation than by reading," was debated with an earnestness and vim worthy of an Alpha Beta. The question was won by the advocates of reading. An essay was presented by H. L. Hunt. Horace Culter read an interesting selection. Under extemporaneous speaking considerable hilarity was indulged in by those present.

At our next meeting the order of debate will be passed; the *Gleaner* will be read; and, as it will be the last meeting of the term, a full house and good time is expected. Come, ye Websters, and let us bury the hatchet, until we meet again next September. GEO.

The Webster Society met last Saturday evening, with President Wood in the chair. It was decided unanimously by the judges that a man should not be allowed to vote till he can read and write. The *Reporter* was not presented, owing to the sickness of the editor. The librarian's report showed that six books could not be found, even after the most diligent search. It was discovered, however, that one of them had been taken from the library and destroyed in an unlawful manner, by two young men belonging to the Society. Owing to the above facts, a resolution was passed by the Society declaring it expedient to expel those members who had been implicated in the affair. Question for discussion next evening is, "*Resolved*, That the object of the Democratic party is to pay the southern war claims, pension the southern soldiers, or destroy the Union." Affirmative, Reeve and Donaldson; negative, Hartmann and Messenger. Select reading, D. S. Leach; declamation, L. A. Salter. LEACH.

The following works have been recently donated to the library: The Reports of the Smithsonian Institution for 1876 and 1877; The Ninth Annual (second biennial) Report of the Illinois Industrial University; and the Sixteenth Annual Report of the Massachusetts Agricultural College.

The report of the Illinois Industrial University is a well-bound volume of about 300 pages. It contains full reports of the proceedings of the Board of Regents during the years of 1877 and 1878, an itemized report of the Treasurer, a detailed statement of the character and organization of the University, several educational papers, and a complete list of the plants of Illinois. The Illinois University was opened in 1868. Since that time 1285 have been matriculated as students. Including the class of 1877, the number of graduates has been 160.

The report of the Massachusetts Agricultural College is a pamphlet of about 120 pages. Its contents consist of reports by the officers of the College, and the catalogue for the year 1878. Whole number of students in attendance, 162. The Massachusetts Agricultural College was opened in 1867. The whole number admitted is 637; the whole number of graduates is 150, of whom 41 are engaged in practical farming or gardening. In the list of the alumni, three are reported as residents of Kansas; one of whom, Mr. Edward P. Chandler, of the class of 1874, is a farmer near Abilene.

NATIONALIST ITEMS.

Irving Todd is now at work in this office.

In the regiment of State militia, organized at Topeka last week, Manhattan furnishes Company B.

Quite a number are sodding their yards with blue-grass this spring. This is the surest and quickest way.

The Kansas Pacific has been assessed at $7,000 per mile in organized counties, and $5,000 in unorganized counties.

Riley county is one of the best counties in the State. There is prairie grass enough to keep ten times the number of cattle and horses that are now in the county.

Miss May Campbell celebrated her eighteenth birthday with a very pleasant little party last Tuesday evening. About eight couple were present, and all enjoyed themselves.

"They say" that Geo. Wake is having a white vest made. He is doing a good business at Ellsworth, and can afford the white vest; so we shall only be ready with our good wishes.

The Methodists are talking about erecting a new church edifice this year. The one now in use is hardly large enough to hold the regular congregation in fair weather; and on extra occasions many are unable to obtain seats.

There are more than ten acres fenced in and under cultivation in one lot southwest of town, with a new house on the place. There are also four good, new dwelling-houses in that part of town, beside the large addition lately put on to Mr. Dimmock's residence.

The Manhattan Guards are booming. Wednesday evening they had an enthusiastic meeting and a good drill. Two dozen uniforms, the style adopted by the brigade at Topeka, will be ordered immediately. The price of these will not exced $8.50, including freight.

Don't forget that Hon. E. B. Reynolds, the great temperance lecturer who made such an impression on our people last spring, will be with us again Monday and Tuesday evenings, May 12th and 13th. He will speak in the Presbyterian Church, and it is hoped that it will be crowded both nights. Let all of his friends come out and give him a right royal welcome.

The people of the State generally will rejoice with the people of Emporia and Lyon county in the fact that they are again to have a building for the accommodation of the Normal School. At a meeting of the Board of Regents held in this city last Thursday and Friday, the necessary steps were taken toward completing the sale of the city and county bonds issued recently; and on Friday they were accepted by the State School Fund Commissioners.—*Emporia Ledger.*

COMMENCEMENT.

The exercises of Commencement will be conducted according to the following programme:

The sermon to the graduating class will be preached by Rev. A. C. Peck, of Lawrence, on Sunday evening, May 18th, 1879, in the Presbyterian Church, at eight o'clock.

On Monday and Tuesday, May 19th and 20th, the term examinations will be held at the College, in the several recitation rooms. One-half of each examination will be oral, and the other half be written answers to written questions. All persons are cordially invited to attend, and will find the following time-table convenient in making a selection of classes:

MONDAY.

8:40 to 10:20.—Arithmetic, Prof. VanDeman; Meteorology, Prof. Failyer; Drawing, Prof. Walters; Telegraphy, W. C. Stewart; Sewing, Mrs. Cripps; Instrumental Music, Prof. Hofer; Carpentry, T. T. Hawkes; Printing, A. A. Stewart.

9:30 to 11:10.—Practical Agriculture, Prof. Shelton; Arithmetic "A," Prof. Platt.

11:10 to 12:50.—Logic, Prof. Ward; Analytical Chemistry, Prof. Failyer; Sewing, Carpentry, and Instrumental Music.

2:00 to 3:40.—Structure "A," Prof. Ward; U. S. History, Prof. Platt; Practical Horticulture, Prof. VanDeman; Industrial Drawing, Prof. Walters; Printing and Telegraphy.

TUESDAY.

8:40 to 10:20.—Structure "B," Professor Platt; Zoology, Prof. Shelton; Industrial Drawing, Prof. Walters; Carpentry, Printing, and Sewing.

10:20 to 12:00.—U. S. History, Prof. Platt; Physics, Prof. Failyer; Sewing, Carpentry, and Instrumental Music.

2:00 to 3:40.—English Literature, Prof. Ward; Arithmetic "A," Prof. Platt; Household Economy, Mrs. Cripps; Industrial Drawing, Prof. Walters; Printing, Telegraphy, and Carpentry.

The Under-Graduates' Exhibition will be held in the Presbyterian Church, Monday evening, May 19th, beginning promptly at eight o'clock. The order of exercises will be as follows:

INVOCATION.

MUSIC.

"Inaugural Address," (*Lincoln*), EDWARD P. COLEMAN.

"The Student," (*anon.*), MISS EMMA CAMPBELL.

MUSIC.

"Agriculture and the Mechanic Arts, (*Bateman*), DARWIN S. LEACH.

"The Right of Petition," (*John Q. Adams*), MISS FLORA DONALDSON.

MUSIC.

"Industry the Road to Prosperity," (*anon.*), JOHN N. MORROW.

"No Shade no Picture," (*Joel Moody*), MISS EMMA GLOSSOP.

MUSIC.

"The Perpetuity of the Union," NOBLE A. RICHARDSON.

"The Closing Year," (*Geo. D. Prentice*), MISS EMMA HOYT.

MUSIC.

"Genius and Study," (*Rev. Orville Dewey*), WILLIAM E. WHALEY.

"Man and the Industrial Arts," (*Dr. Geo. Wilson*), MISS GRACE PARKER.

MUSIC.

BENEDICTION.

On Tuesday evening Hon. W. W. Guthrie, of Atchison, will deliver the Annual Address before the College, at the Presbyterian Church. Exercises begin at eight o'clock sharp.

The Commencement exercises will take place at the same church, on Wednesday, May 21st, at 8:00 P. M. The programme will be presented next week.

On Monday and Tuesday evenings the College singing class will furnish the music; and on Sunday and Wednesday evenings the music will be rendered by Manhattan singers.

Great efforts are being put forth this year to make Commencement week pleasant and profitable. We hope to be able to announce next week that excursion rates will be given on the Kansas Pacific to all who desire to be present.

THE INDUSTRIALIST.

SATURDAY, MAY 10, 1879.

DEPARTMENTS OF INSTRUCTION.

DEPARTMENT OF AGRICULTURE.

PRACTICAL AGRICULTURE.

Second Year:—General principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage.

Fourth Year: General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of a rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farm-houses; barns.

FARM ECONOMY.

Woman's Course, Fourth Year: Dairy products as human food; influences affecting character of milk; manufacture of condensed milk; the factory system and household plan of cheese-making; treatment of rennet; general process of cheese manufacture; subsequent treatment of cheese; butter-making; creameries; "deep" and "shallow" setting systems; general process of butter-making; packing and preserving butter.

DEPARTMENT OF BOTANY AND PRACTICAL HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest; also a course of lectures on Landscape Gardening. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard; fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture; shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in in the work of laying out and plotting grounds topographically.

CHEMICAL DEPARTMENT.

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life. Text-book, Ganot.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blow-pipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

Are constantly in progress in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

DRILL IN ENGLISH.

"As grammar was made after language, so ought it to be taught after language."—*Herbert Spencer.*

Drill in English embraces the following topics:

Sounds of the language; drill in producing the vocal, sub-vocal and aspirate elements with accuracy, distinctness and volume; vowels, consonants.

Letters: Form; power; rules for spelling, drill.

Words: Signification, properties, modifications, variations, relation and dependence.

Sentences: Drill in statement of ideas; description, clearness, terseness, vigor; business letters, discussion; capitalization; syllabication; punctuation; construction and analysis of sentences; elements, uses and names; criticism of compositions printed as written; proof reading; grammatical construction; superfluous words and clauses; drill in reading, speaking and penmanship.

Text-books: Webster's Academic Dictionary; Lee & Hadley's Advanced Lessons in Language.

Pupils deficient in spelling, etc., should enter the printing class, the printing-office being the work-shop of language.

STRUCTURE OF ENGLISH.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

MATHEMATICAL DEPARTMENT.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

DRILL IN ARITHMETIC.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Following this line, the student, so far from hammering away at "pure" science draws from the mathematical store-house what he needs, and sees why he needs it. Accuracy of calculation and posting, rather than a *mere* comprehension of the principles, is aimed at. Besides the recitation-room drill in business forms, practice in the field is also given. Estimating the number of cords in a pile of wood said to be 100x4x4 feet is one thing; measuring a pile of wood through which any number of cats may be harmlessly thrown, and in which four-feet sticks are the exception, is quite another and more difficult thing.

ARITHMETIC AND BOOK-KEEPING

Is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides ensuring arithmetical practice, develops practical skill in that important art.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admiral system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study. In addition, constant practice in the application of lines to metal and wood is furnished in the Blacksmith, Carpenter, Turning, Scroll-sawing, Carving, Engraving and Printing shops, and to fabrics in the Sewing Department.

PRACTICAL GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the use of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

PRACTICAL SURVEYING.

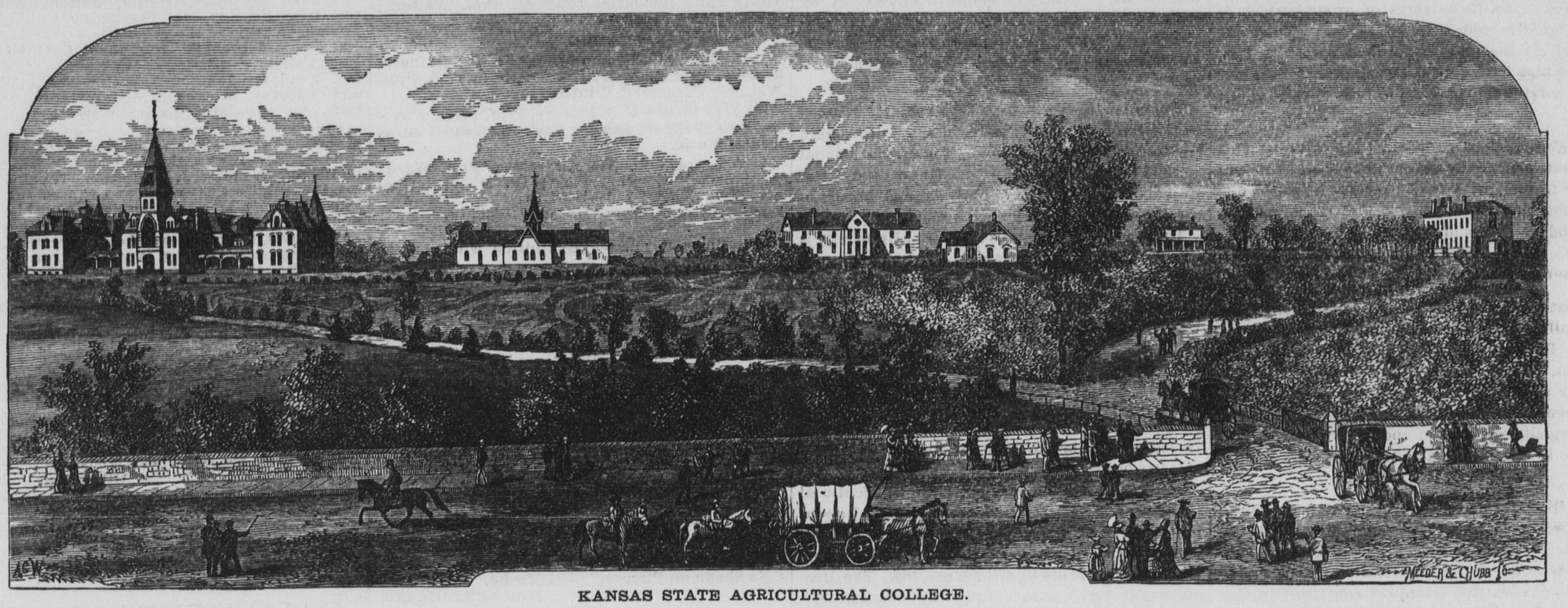
The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

STUDIES SPECIAL TO WOMAN.

FARM ECONOMY considers those affairs of the farm which usually come under the supervision of the farmer's wife or daughter, and which are not included in "gardening" or "household economy;" such as butter and cheese-making, dairy management, etc. A course of lectures is delivered by the Professor of Practical Agriculture. See heading, "Farm Economy."

GARDENING is included in Practical Horticulture. See heading, "Landscape Gardening."

HOUSEHOLD CHEMISTRY. See heading, "Household Chemistry."



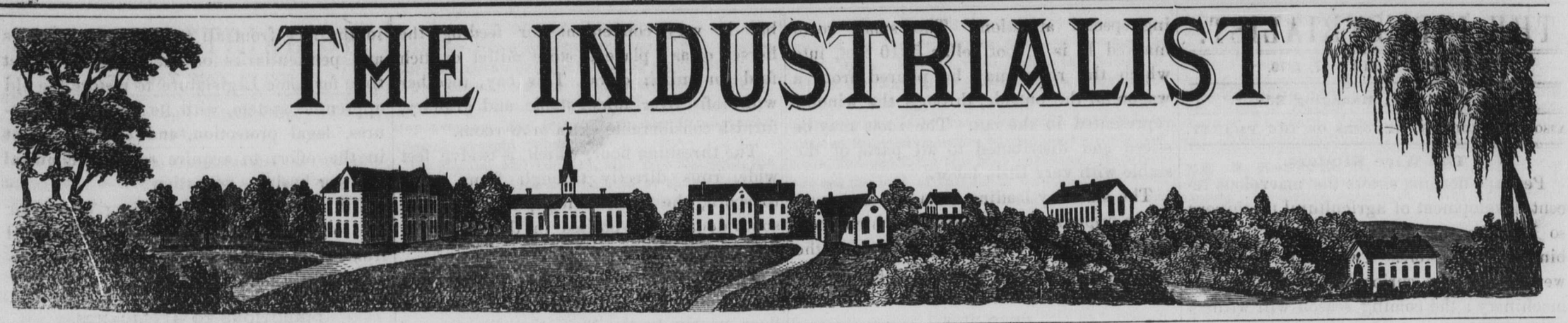
KANSAS STATE AGRICULTURAL COLLEGE.

At first glance there appears a striking contrast in the two cuts of the College that appear in the INDUSTRIALIST. A slight examination, however, will show that the difference is due wholly to the principle of "perspective," applied to both space and time. In this cut the point of observation is outside of the College grounds, about six hundred yards from the line of the buildings; in time, the perspective is about three years from date.

This picture shows the plan upon which the improvements have been made during the last four years. The right wing of the main building has been erected, and is already occupied. It will cost about $50,000 to make the representation of the buildings and grounds in the cut a reality; and we confidently expect that sum of money will be appropriated by the next Legislature of Kansas.

But no adequate conception of an institution of learning can be obtained by a view of its buildings and grounds. We wish it were possible to present to our readers an interior view of the Agricultural College,—the good, honest work daily done in shop, office and class-room; the groups of earnest, thoughtful, sensible young men and women, as they now are, and what they will become two or three years hence, under the vigorous discipline of our industrial course of study.

THE INDUSTRIALIST



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THE INDUSTRIALIST.

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Address A. A. STEWART, Manhattan, Kas.

The Cost of Credit.

Credit is a marketable commodity, and costs the purchaser precisely what it is worth to the seller. In estimating its cost, there are several things to be taken into account besides the mere matter of interest. Interest is defined by the scientific political economist as renumeration for the use of money, which is property accumulated by labor, just as a house, or cleared land, or a ship, is property produced by labor. For the use of a house or land, rent is paid; for the use of a ship, freight is charged; and for the use of money, interest is charged. This is just and inevitable. When a person obtains the use of any money or money's value, he is called upon to pay, and is morally bound to pay, a reasonable sum for this use; and from time immemorial this has been called interest. But delays in payment incur many other expenses than this. If every debtor were certain to pay his debt when due, there would be no necessity for the seller of goods or lender of money to calculate upon, or require, any other charge than the interest. But debtors fail to pay in an uncertain proportion to the number of them: but every year there are more or less of them who do not meet their engagements in time, or fail to pay at all; and actually—speaking literally and to the point—cheat their creditors, perhaps not intentionally, but none the less effectively, out of their just dues. In business this risk of loss enters into the estimates of expenses as inevitably as interest upon the use of the money, and must be provided for out of the cost price of goods made and sold.

Again: A credit business involves the use of a greatly increased capital; several times larger than would be required if cash were paid on delivery. This is evident, and can be made plain to a farmer who would for a moment consider what would happen if circumstances were changed, and he were obliged to wait a whole year for the money for his pork, wheat, butter, cheese, and other products. He would have to double that part of his capital which represents all this property; that is certain, or he could not pay wages, meet expenses, provide seed and fertilizers, and sustain the numberless charges which fall upon his business in the course of a year. The people from whom he buys are then placed in precisely this predicament, when he buys on a year's credit. It is necessary that they should purchase and carry two years' stock of materials, and find money to pay for two years' labor; and this also involves larger buildings, the risk of depreciation in value, cost of extra insurance, and other onerous charges. No business man can afford to take risks. Security is the life of business, and he must provide against whatever event might bring a loss to him; and it is common prudence that would estimate the charges which thus arise, in a sufficiently liberal manner to be on the right side, and so avoid uncertainty. Then, a year's credit involves the necessity for the keeping of many accounts, and for collecting many debts; and these are troublesome and expensive services done for the debtor, for which, of course, he must pay.

It is hardly necessary to pursue this point further. Any thoughtful person can see through it, and can realize to what a large extent it enters into all kinds of business. Let such a man put himself in the place of another, forced to do a large credit business; to suffer constant harrassing anxieties; to be ever on the most lively watch; to keep himself informed continually on hundreds of important points; to meet hundreds of otherwise needless expenses;—and he will acknowledge readily the seriousness of this consideration. What all this costs the purchaser, can hardly be told. But one can form an idea of its cost, if he will think of it in this light: Let him sell a cow to this man; a bushel of wheat to that; a load of corn to another; and so distribute his year's productions among a thousand people, opening accounts for every one, watching when these come due, writing off lost accounts of defaulting debtors, and, in fact, selling just as he buys; and then figure up the result.

This will be the cost of credit business from the seller's point of view; but a much worse condition of circumstances can be shown to exist from that of the buyer, and to appropriate the pertinent words of Hamlet: "Thus bad begins; but worse remains behind." The truth of this we shall endeavor to show hereafter.—*Rural New-Yorker.*

Lightning Farming.

The latest scientific intelligence from Europe brings accounts of some extraordinary experiments now under consideration of the French savants. M. Grandeau, of the School of Forestry, Paris, reports the following among numerous equally astonishing results: In April last he took two tobacco plants, each weighing about fifty grains, and having four leaves. They were both planted in boxes containing mold of identical quality, and placed side by side in a position favorable to their growth. They were permitted free circulation of air, light and water. One was supplied with a "lightning-rod," or electric conductor, and the other left free to the influence of atmospheric electricity. The plants were left to themselves until the middle of August. That under the influence of electricity attained a height of three feet five inches, and weighed about 44,000 grains; the other measured two feet four inches high, and weighed 22,000 grains,—about one-half. This is only one of the many results obtained. If electricity is to become a factor in farming, as it is already one in mechanics, we may expect to see some wonderful and substantial revelations, perhaps exceeding the telephone and its allied wonders. Instead of carefully conducting lightning in the ground, we may have, by an ingenious system of net-work distributors, whole farms fertilized by lightning in a shocking manner. Prof. Tobin thinks the scheme altogether practicable; and says that in a few years every farmer will be using these lightning fertilizers.—*Exchange.*

THE heavy rains of the past few weeks have set the wheels of agricultural prosperity in motion; and this in turn has caused a corresponding prosperity in the mercantile markets of the country. The rains of Kansas have reached in effect the shores of the Old World. Keen, the notorious wheat speculator, was by these timely rains prevented from unloading seven million bushels of wheat in the English market. The rains may not cause his bankruptcy, but they have checked the upward tendency of wheat which was held by speculators.—*Hutchinson Interior.*

THE daily newspaper and the monthly review are more potent and permanent factors in a useful education than the works of a Roman orator or a Grecian philosopher. Yet the average student never reads the review, and seldom the daily paper. They "have not time." When they emerge from the college chrysalis into full-fledged citizenship, they find that they are four years behind their brethren who have not pursued a collegiate career. This class is, of course, small, but is to be found in every college in the land, and furnishes the examples for those who pronounce college education unpractical and useless.—*University Courier.*

Our Exchanges.

It is reported that the Legislature of Michigan has made a handsome appropriation for the erection of additional buildings at the Agricultural and Mechanical College, at Lansing, for the practical education of girls. This is as it should be.—*Grange Bulletin.*

According to the First Quarterly Report of the State Board of Agriculture for 1879, Butler county had in cultivation 138,904.67 acres of ground, the products of which were worth $1,673,107.25; or an average of $12.-04 an acre. This is the largest return of any county in the State.—*Augusta Gazette.*

Deputy Sheriff Nichols took a railroad ride to Great Bend last week, and counted on the way there 1,000 wagons, all within sight of the cars, "going West." The fact is, the whole State of Kansas is dotted with the white covers of the "prairie schooner," and marvelous settlement is going on.—*Emporia News.*

The high, dry hillside, where the most nutritious grasses and herbage are found, is most generally neglected and avoided by the heavier-bodied animals, such as cattle and horses, but it is the sheep's veritable paradise. They rejoice to ascend the steep declivities; and with their fluted teeth will eat off all that suits their tastes, even to a part of the very roots. Each stone and boulder is carefully and closely trimmed of the tender grass that grows around it, that other animals would not touch or would refuse to live upon.

Our sheep remain signally healthy. There are few of the ovine disorders peculiar to our country that infest and thin the flocks in other localities. A peculiar kind of catarrh, and scab, and usually ticks, are what the Kansas farmer must avoid; and in well-cared-for flocks these are seldom if ever found. The first comes from wet and cold; the second, from contagion: and nothing short of grossest negligence and carelessness will ever permit ticks to unreasonably affect a flock of sheep.—*J. Sharp Walker, in Kansas Agriculturist.*

The Texas Drouth.

Reports from the country yesterday were very disheartening. The rain which we thought fell in the northern portion of the county a few nights ago amounted to hardly more than a light sprinkle,—not enough to more than lay the dust for a few hours. On many plantations the wheat is not more than one foot high, and is heading out. Farmers are holding back for rain before planting cotton, as it would be labor lost to sow seed. Fears are entertained of a famine in corn and oats; and hence the price of the old crop of corn is advancing, with nearly every one holding on to all they have. So far, our vegetables are nearly a total failure. The Dallas market at no time this spring has shown scarcely any at all. The supply is getting less and less every day. At the hour of writing, the high and dry winds which have prevailed for three weeks are still blowing, with no moisture or humidity in the air, and not a cloud to be seen in the heavens. The situation is bad enough. It was never worse, and has not been so bad in the memories of thirty years as it is now. All hope of wheat is about abandoned. There is time enough, however, to make a cotton and a corn crop if we can get a rain. The drouth covers all that portion of Texas lying upon a line of Denison and San Antonio, including every county west of it, and an average ot two counties east. In portions of this territory, people are hauling water for drinking purposes from three to six miles, and the cattle depend upon the larger streams, all of which are lower than can be remembered.—*Dallas Herald.*

THE INDUSTRIALIST.

SATURDAY, MAY 17, 1879.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

The Wire Binders.

Perhaps nothing shows the marvelous recent development of agricultural machinery so well as the general adoption of self-binding harvesters. Two years ago they were among the curiosities of agricultural machinery: the coming season will witness them in use in nearly every considerable field in the West. It is stated that during the past season 25,000 of these machines were placed in the hands of western farmers. The immensity of this interest is strikingly shown by the fact that a single firm, the Cleveland Rolling Mill Company, has on hand orders for 6,000 tons of steel wire, to be furnished the coming season.

Nevertheless, the use of wire binders meets with much opposition, especially from the stockmen and millers. The former assert that the bits of wire devoured with the straw by the cattle lacerate the membranes of the stomach, causing the death of many valuable animals. The millers are even louder in their complaints: their burrs are injured and bolting-cloths cut; and, after trying various devices which do not remove the wire,—among these driving the wheat over powerful magnets,—have "resolved" to pay a reduced price for wheat harvested with the self-binder. However, it is quite certain that the wire binder will come out ahead; for the reason that the gain to the farmers by the use of the self-binder is much greater than the loss to the stockmen and millers.—*Prof. Shelton.*

General-Purpose Barn.

Below is given the plan of basement and ground floor of a barn planned while a member of the class in Practical Agriculture. It is to be built on M. J. Salter's farm, near Thayer, Neosho county. The barn is intended for a farm of about one hundred and sixty acres; and is adapted to a system of mixed husbandry, rather than for grain exclusively.

This barn is sixty feet long by thirty-two feet wide; consisting of a basement, which is to be of stone, and one story above, which may be of wood or stone,—the basement being eight feet and the upper story fourteen feet in height. It is to be situated on a side-hill of moderate slope, sufficient to admit of the basement. The barn will stand east and west, the basement doors opening into the barn-yard on the south.

The basement contains the following apartments:

CATTLE STALLS.

A single row of cattle stalls, C, in the east end, which are 4x9 feet, including manger. At the rear of the stalls is a manure gutter six inches deep and two feet wide; and beyond, next the wall, is a passage two feet in width, and on a level with the floor. Near the center of the basement is a double tier, A, consisting of stalls of the same size, and having a similar gutter three feet wide, which separates the two tiers. The main passage-ways or alleys, marked B, toward which the animals are all headed, and from which all the feeding is done, are five and one-half feet wide. Besides being very convenient for feeding, the alleys may frequently be of service as a place to tie young calves in front of their mothers.

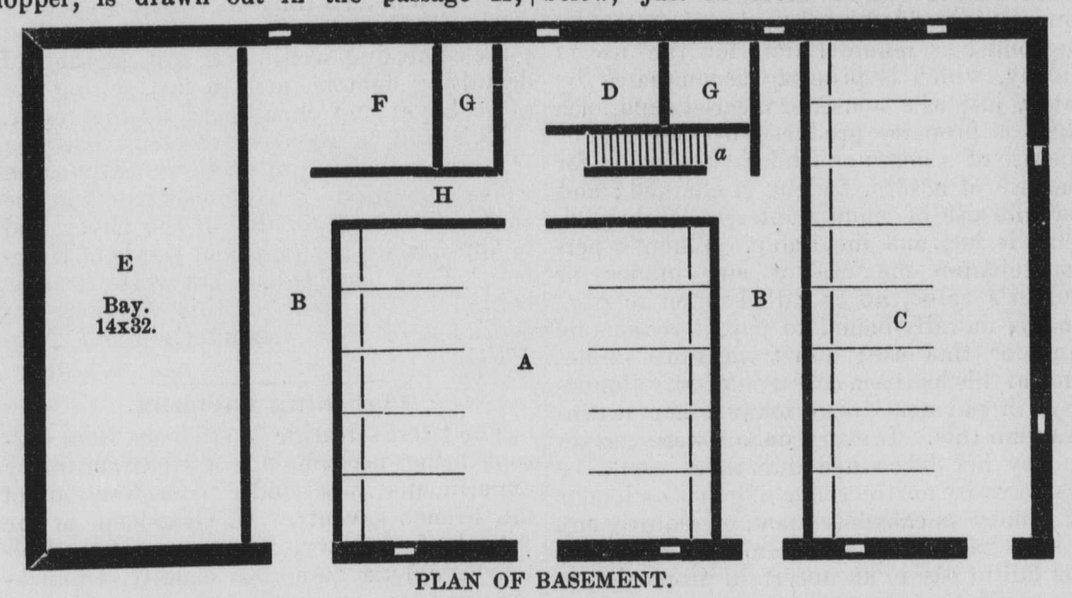
BOX STALL AND ROOT CELLAR.

There is also one box stall 8x10 feet, which is marked F in the cut. This is designed for a bull, but it may prove a very convenient hospital for any animal requiring special attention. The small room marked D is a root cellar 5x10 feet, into which the roots may be poured from a wagon on the outside, through the window represented in the cut. The roots may be sliced and distributed to all parts of the stable with very little labor.

The stairway leading from the basement to the upper story is marked *a*, which indicates the upper landing in both cuts, the landing below being at the entrance to the root cellar.

FEED BINS.

The two apartments marked G are feed bins, being 4x8 and 6x8 feet, the larger one opening in the space under the stairs, which cannot be shown in the cut. These bins are quite convenient. The feed, being poured in from the floor above through a hopper, is drawn out in the passage H,



PLAN OF BASEMENT.

which is four feet wide, and distributed to the stable on either side.

BAYS AND UPPER FLOOR.

The main bay, marked E in both cuts, reaches from top to bottom, being 14x32 feet below and two feet wider above.

The horse stable, marked K, occupies a space 14x28 feet on the ground floor. It consists of three double stalls and one single one, which are nine feet long including the manger, and leaving an alley five feet wide at the rear.

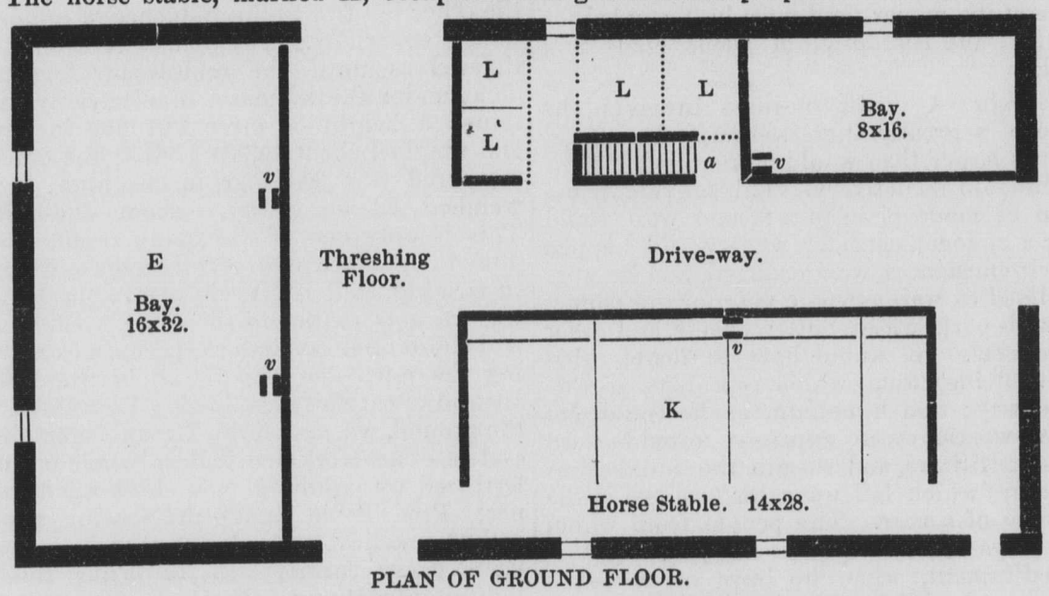
Upon this floor is also situated a small granary, marked L, 8x16 feet including the stairs. The most easterly bin, intended more especially for oats, is entered from the landing of the stairs, and is convenient for feeding. Though the granary is small, it is large enough for the grain intended to be raised; and is conveniently situated in regard to the threshing floor. While it will not admit of a fanning-mill, one may be placed in the drive-way, just at the entrance. The corner bin is slightly rounded, which is not shown in the cut, to more readily admit of the passage of a wagon from the drive-way out through the threshing floor, or *vice versa*.

We have also on this floor a small bay 8x16 feet, which may be filled from the drive-way, which is ten feet wide and will admit a small load of hay or grain. This bay is very convenient for feeding the horses, or as a place to store millet or such feed for milch cows. This bay, together with lofts over horse stable and granary, furnish considerable extra mow room.

The threshing floor, which is twelve feet wide, runs directly through from north to south, the straw being passed out the south door and deposited in the barn-yard below.

The ventilators, marked *v*, are two feet square, and rise perpendicularly from the floor nearly to the roof, the direction of which they follow to the apex, where they terminate in two double-roofed cupolas. These shafts are of smooth-planed lumber, and provided with trap-doors at different heights, through which hay may be pitched from the mows, falling in the feeding alleys below, just in front of the cattle. The basement is further ventilated by windows on the north, south and east sides.

We have not of course entered into the details, simply giving the general plan of the barn, which we think has some advantages of comfort and convenience as a barn for general farm purposes.—*L. A. Salter.*



PLAN OF GROUND FLOOR.

Educated into Prison.

Messrs. Editors:—In the April number of that very able magazine, the *Penn Monthly*, of Philadelphia, I find this quotation from the annual report of the authorities of Connecticut: "Millions are annually expended in this State (Connecticut) to secure our youth the advantages of a good common-school education, with the general impression that such instruction is a sure preventative of crime. Without intending the slightest reflection against this happy conclusion, we find our penitentiaries are filling up with many well-educated young men who, on investigation, have never been indentured to any regular trade or business, and, without employment, are easily led into temptation and vice. On careful inquiry of our younger prisoners, we find it is not the want of a common-school education so much as the need of a good trade, with its habits of thought, industry and common employment, that crowds our streets with paupers and our State prisons with convicts. With these facts staring us in the face from all the jails, work-houses and penitentiaries of our State, is it not time for some Legislature to restore the old apprentice system, with its binding indentures, legal protection, and encouragement in the effort to acquire some mechanical trade or business education?"

I think it is, at least, a strong reason for an industrial education, as distinguished from the ordinary routine of common-school training. C.

DIRECTIONS TO APPLICANTS.

TERMS OF ADMISSION.

Candidates for admission must be fourteen years of age, and pass a satisfactory examination in reading; arithmetic, through decimal fractions; and English grammar, to syntax. Classes are started at the beginning of each year in Drill in Arithmetic and Drill in English; and the pupil must have the knowledge above indicated, else he will be unable to retain position if admitted.

Pupils will be received at any time during the year, if able to pass an additional examination upon the subjects studied by the classes which they expect to enter. But they will find it greatly to their advantage to be present at the opening of each term, or as soon thereafter as possible.

GRADES.

Both the Literary and Industrial recitations are graded daily upon a scale of 100; and an examination of all classes is made at the close of each month. A student not attaining an average grade of sixty is promptly dropped to a lower class, or excluded from the Institution until able to do so. The work of grading is strict and uniform in all the departments, and this process is rigorously used for sifting out incompetent and indolent pupils; thus more than accomplishing all that is designed to be effected by a "high standard of admission." Hence, the student's continuance in the College wholly depends upon his own action.

The course is based upon the determination to make the labor required in the preparation of one industrial and three literary recitations as much as the average student can perfectly perform, in ten hours a day. We design to give the pupil the worth of the time expended at College; and, in order thereto, he must do a full day's work with brain or hand. Only those students who can maintain a standing of ninety in each study will be allowed to take more than the prescribed number of recitations; and no one will be permitted to have less than one industrial and three literary recitations.

RELIGIOUS.

Unless otherwise directed by parents, students are required to attend chapel at 8:30 A. M. on academic days, and divine service once every Sabbath.

EXPENSES.

There are no charges whatever for enrollment, attendance or instruction in the regular courses; nor are there any "contingent fees" for the repair of buildings, for the use of books or apparatus, for diplomas, or the kindred privileges usually grouped under the term "contingent." Male students are furnished instruction, the use of apparatus, instruments or tools, in both the literary and industrial classes marked out for them, without any charge. And the same is true of female students in the regular classes provided for them. Printing and Telegraphy are industrials primarily provided for the education of female students, and male students taking either of these are charged $1 per month for use of instruments.

Instrumental music is a fine art or "accomplishment," rather than a mechanical art. We do not place it among our "industrials" in the same sense, or for the same purpose, that we do those provided for teaching the trades. Accordingly, a fee of $12 per term, or seventy-five cents per week is required from female students for tuition and the use of pianos or organs.

The only charge made for material in either the literary or industrial departments is for the chemicals used by students in laboratory practice, which are furnished at wholesale prices, and amount to but a small sum.

Furnishing an absolutely free education is as much as can be reasonably asked; and the Institution neither boards, clothes, nor supplies the student with text-books. Boarding can be obtained in private families at from $2.75 to $4 per week. Washing costs from seventy-five cents to one dollar per dozen. Text-books, which can be procured in Manhattan, cost from $2 to $5 per term.

No student need expend over $5 per week; and many of our best pupils are living at $1.25 per week. Students desiring to "board themselves" can do so at from $1 to $2 per week. In a club of four young men, renting a house, the average cost to each for the term was $1.11 per week.

AMOUNT EARNED.

It is impossible to predict how much a given person can earn, since that depends upon what he can do and what work there is to be done. Hence, it is wholly impossible for us to answer the question so often asked: "Do you think I can meet my expenses by work?" Some students make one-half their expenses, some the whole, and exceptional men have made more than expenses. As a rule, a faithful boy skilled in farm work can earn half his expenses on the Farm or in the Nursery. During the year he can ordinarily acquire sufficient skill in the wood or iron shops to enable him to make articles for sale. The whole question is one for his own consideration and decision. We can teach all who come, but cannot absolutely *promise* anything more. Hitherto we have refrained from holding out strong inducements respecting the amount of labor we might have to offer; but in view of the fact that during each of the last three years we have had more to do than the students could perform, we are inclined to give greater and positive encouragement on this point. Any boy who is in dead earnest, who is familiar with farm operations, and who can raise $50 to start with, should be able to carry himself through the four years' course. And certainly this places an education within the reach of every determined boy. As yet we are unable to offer similar advantages to girls, not requiring labor in the College departments which they can perform.

THE INDUSTRIALIST.

SATURDAY, MAY 17, 1879.

Clover is in full bloom; wheat, ditto. We shall begin haying next week.

We will send the INDUSTRIALIST to students during the summer vacation, postage paid, for twenty cents. Every student should subscribe.

We acknowledge the receipt of an invitation, from the committee of arrangements, to be present at the ceremonies of decoration day, in Topeka.

We were favored yesterday with a pleasant visit from Mrs. Prof. Ward, and Mrs. G. C. Wilder, the well-known correspondent of the New York papers.

Everybody is cordially invited to attend the examinations on Monday and Tuesday of next week. Oral examinations of some classes will occur during every hour.

The engraving on our fourth page is a copy of an illustration in the Kansas edition of the Eclectic School Geography, published by VanAntwerp, Bragg & Co., Cincinnati, Ohio.

The *Western Agriculturist*, Quincy, Ills., is rightly named. It is agricultural and western all over, and one of the very best agricultural monthlies printed. We always read it with pleasure.

For a neat job of "rule" work, Mr. Editor, please fix thy cold, glittering eye upon the barn "cut" on the second page. The hero and general artificer of the afore-mentioned is A. A. Stewart, of course.

C. O. Smith and A. H. Stiles, former College students, dropped in upon us unannounced last Monday afternoon. The boys are looking well and doing well. They expect to be here again next week.

Quite a number of our students from distant parts of the State have decided to remain in this vicinity during the long vacation. Some of them desire employment. Those securing their services will find these young men industrious, and every way reliable.

Those attending the Commencement exercises of the Agricultural College, and paying full fare, will be returned at one-fourth rate to any point on the Kansas Pacific Road in this State, provided they secure a certificate signed by the acting President of the College.

We heard of a student yesterday who received from the hands of loving parents money sufficient to purchase a trunk for his homeward journey. Alas, the ingratitude of the human heart! He put the money in his pocket, and ——made for himself a better one than he could have bought.

On the editorial page of to-day's issue will be found a barn plan which will well repay careful study by those intending to build. The plan was made by one of our students, Mr. L. A. Salter; and we understand that Governor Salter is now constructing a substantial farm barn on this plan.

The present week closes the real work of one of the busiest and pleasantest terms in the history of the College. During this long time of nearly five months, not a single student has been before the Faculty for correction; and scarcely a word by way of reproof has been given. Work has been the all-sufficient corrective.

The man who, when in town last week, declared in dolorous accent that the weather acted "just as it did in the spring of '60," was seen to purchase an umbrella before starting for his home in the country. The poor fellow was thoroughly soaked before he had passed the College grounds; and, in attempting to ford what had heretofore been a tiny rivulet, was swept away by an avalanche of water. The body has not yet been recovered.

The average standing of the graduating class in all their studies, during the time they have been in the College, is as follows:

Ella Vincent	92.83	W. K. Eckman	95.83
H. C. Rushmore	92.88	C. J. Reed	96.16
Ettie Campbell	93.00	L. A. Salter	96.25
W. H. Sikes	95.00	A. T. Blain	97.85
C. E. Wood	95.80		

The standing is very high. Mr. Blain, as first, takes the valedictory; and Mr. Salter, as second, the salutatory.

We have on hand some bound volumes of the INDUSTRIALIST, which we will sell at the following figures: Vol. II., from April 15, 1876, to April 14, 1877, $1.00; first half of Vol. III., from April 14, 1877, to Oct. 6, 1877, fifty cents; second half of Vol. III., and Vol. IV., from Oct. 6, 1877, to April 12, 1879, $1.50. These figures do not include postage. Persons desiring to purchase any of the above, should order immediately, as we have but few copies. Old students will find these bound volumes especially interesting and valuable. Address A. A. Stewart, Manhattan.

COMMENCEMENT.

The exercises of Commencement will be conducted according to the following programme:

The sermon to the graduating class will be preached by Rev. A. C. Peck, of Lawrence, on Sunday evening, May 18th, 1879, in the Presbyterian Church, at eight o'clock.

On Monday and Tuesday, May 19th and 20th, the term examinations will be held at the College, in the several recitation rooms. One-half of each examination will be oral, and the other half be written answers to written questions. All persons are cordially invited to attend, and will find the following time-table convenient in making a selection of classes:

MONDAY.

8:40 to 10:20.—Arithmetic, Prof. VanDeman; Meteorology, Prof. Failyer; Drawing, Prof. Walters; Telegraphy, W. C. Stewart; Sewing, Mrs. Cripps; Instrumental Music, Prof. Hofer; Carpentry, T. T. Hawkes; Printing, A. A. Stewart.

9:30 to 11:10.—Practical Agriculture, Prof. Shelton; Arithmetic "A," Prof. Platt.

11:10 to 12:50.—Logic, Prof. Ward; Analytical Chemistry, Prof. Failyer; Sewing, Carpentry, and Instrumental Music.

2:00 to 3:40.—Structure "A," Prof. Ward; U. S. History, Prof. Platt; Practical Horticulture, Prof. VanDeman; Industrial Drawing, Prof. Walters; Printing and Telegraphy.

TUESDAY.

8:40 to 10:20.—Structure "B," Professor Platt; Zoology, Prof. Shelton; Industrial Drawing, Prof. Walters; Carpentry, Printing, and Sewing.

10:20 to 12:00.—U. S. History, Prof. Platt; Physics, Prof. Failyer; Sewing, Carpentry, and Instrumental Music.

2:00 to 3:40.—English Literature, Prof. Ward; Arithmetic "A," Prof. Platt; Household Economy, Mrs. Cripps; Industrial Drawing, Prof. Walters; Printing, Telegraphy, and Carpentry.

The Under-Graduates' Exhibition will be held in the Presbyterian Church, Monday evening, May 19th, beginning promptly at eight o'clock. The order of exercises will be as follows:

INVOCATION.

MUSIC.

"Inaugural Address," (*Lincoln*), EDWARD P. COLEMAN.

"The Student," (*anon.*), MISS EMMA CAMPBELL.

MUSIC.

"The Right of Petition," (*John Q. Adams*), MISS FLORA DONALDSON.

"No Shade no Picture," (*Joel Moody*), MISS EMMA GLOSSOP.

MUSIC.

"Tribute to Bayard Taylor," (*Whitelaw Reid*), MISS EMMA HOYT.

"Agriculture and the Mechanic Arts, (*Bateman*), DARWIN S. LEACH.

MUSIC.

"Industry the Road to Prosperity," (*anon.*), JOHN N. MORROW.

"Man and the Industrial Arts," (*Dr. Geo. Wilson*), MISS GRACE PARKER.

MUSIC.

"The Perpetuity of the Union," (*Storey*), NOBLE A. RICHARDSON.

"Genius and Study," (*Rev. Orville Dewey*), WILLIAM E. WHALEY.

MUSIC.

BENEDICTION.

On Tuesday evening Hon. W. W. Guthrie, of Atchison, will deliver the Annual Address before the College, at the Presbyterian Church. Exercises begin at eight o'clock sharp.

The Commencement exercises will take place at the same church, on Wednesday, May 21st, at 8:00 P. M. The programme is as follows:

INVOCATION.

MUSIC.

"*The Young Kansan*," L. A. SALTER, Montgomery county.

"*Woman's Work*," MISS ELLA VINCENT, Riley county.

"*The Elements of Progress*," H. C. RUSHMORE, Jefferson county.

MUSIC.

"*As the Twig is Bent*," MISS ETTIE CAMPBELL, Riley county.

"*Untrodden Paths*," W. H. SIKES, Pottawatomie county.

"*The Force of Ideas*," C. E. WOOD, Pottawatomie county.

MUSIC.

"*The Valley of the Solomon*," W. K. ECKMAN, Osborne county.

"*The True Education*," C. J. REED, Pottawatomie county.

"*Men of Thought and Men of Action*," A. T. BLAIN, Riley county.

MUSIC.

BENEDICTION.

On Monday and Tuesday evenings the College singing class will furnish the music; and on Sunday and Wednesday evenings the music will be rendered by Manhattan singers.

Great efforts are being put forth this year to make Commencement week pleasant and profitable. Excursion rates have been obtained on the Kansas Pacific Railway for visitors attending Commencement. They will pay full fare one way; and, by presenting a certificate of attendance to the agent at Manhattan, will be returned for one-fourth regular rates. We hope that many of the students' friends and others will improve this opportunity to attend the closing exercises of the College year.

At the last Faculty meeting ushers were appointed for the various exercises of Commencement week. Now, a word about the duties of ushers, of which there exists a popular misapprehension. The usher is purely an ornamental character; or, if he has any specific duty, it is to mislead innocent persons, to give good people bad seats, and bad folks the best cushions. So, when you see the lord of the aisles bearing down upon you, intimate your intention of following him, but remember his base purpose and drop into the first empty seat, leaving him to march grandly on toward the rostrum. As he returns, be sure and catch his eye, for it will contain a peculiar light; and, if at this juncture you should gracefully pull down the nether lid of one of your own orbs, it would but be in harmony with your other actions, and we know it would be appreciated by the usher.

The Webster Society was presided over last Saturday evening by Vice-President Morrow. The Society was not called to order until rather late, owing to the exhibition in electrical phenomena that was given by Prof. Failyer. His experiments were a complete success, and all felt amply paid for the trouble of attending. The order of debate was passed, as considerable time would be occupied in completing the business that would come up under the resolution introduced the previous meeting. A great many visitors were present, all of whom took an active part in extemporaneous speaking, making that order one of the most interesting of the evening. Mr. Salter declaimed, and your reporter read as per programme; but the real solid business of the session came up under the head of "New Business." It was moved that the members accused of purloining the book should be expelled from the Society. A red-hot time ensued, but the matter was carried on in a spirit of fairness and impartiality. The motion was finally lost; but the matter will be brought up again at the next meeting. The order of debate being passed, the question for discussion will remain as last reported. The *Reporter* will be presented by A. Beacham. This is the last meeting of the Society, and it is earnestly desired that every member of the Society should be present.

L.

NATIONALIST ITEMS.

The bridge over the Kansas is being refloored.

The roses have been in blossom and blue-grass headed out for a week past.

Ashford Stingley is having a neat brick walk laid from the front gate to the side door of his residence.

Thirty more exodites arrived to-day. They are a more able-bodied set than the first lot. Those wanting help should apply immediately.

Stingley & Huntress have received, in the past ten days, over seventy tons of merchandise. They report business good in all departments.

The road which passes by the south side of the College farm, and which is now much traveled, on account of the way through the farm being closed, is being turnpiked.

G. W. King is having a nice fence built around his premises on College Hill. The house and grounds are also greatly improved; and it will soon be an attractive place.

Seven car loads of cattle, averaging 1,589 pounds, were shipped from this place on Monday. They were fed by John Gifford, in this county, for G. S. Taylor & Co., of Kansas City.

The Kansas Pacific Land Department sold, during the month of April, 43,311.33 acres of land. Average price, $5.10 per acre. During the first week of May, 4,776 acres were sold.

RAILROAD TIME-TABLE.

KANSAS PACIFIC RAILWAY.

PASSENGER ARRIVES.

No. 2, going East	11:14 A. M.
No. 4, going East	3:47 A. M.
No. 1, going West	5:10 P. M.
No. 3, going West	4:33 A. M.
No. 7 (freight), going West	8:15 A. M.

Nos. 1 and 2 run daily; Nos. 3 and 7 run daily except Monday; No. 4 runs daily except Sunday. Passengers with tickets are carried on No. 7.

GEO. C. WILDER, Agent.

LITERARY SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in College building every Friday at 2 P. M. Ladies admitted. New students cordially invited to attend. GEORGE PERRY, President.

MISS GRACE PARKER, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Telegraph Hall every Saturday evening. Visitors, especially students, always welcome.

C. E. WOOD, President.

C. M. SHARTEL, Secretary.

THE INDUSTRIALIST.

SATURDAY, MAY 17, 1879.

DEPARTMENTS OF INSTRUCTION.

DEPARTMENT OF AGRICULTURE.

PRACTICAL AGRICULTURE.

Second Year:—General principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage.

Fourth Year: General view of agriculture, an cient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; genera advantages of a rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farm-houses; barns.

FARM ECONOMY.

Woman's Course, Fourth Year: Dairy products as human food; influences affecting character of milk; manufacture of condensed milk; the factory system and household plan of cheese-making; treatment of rennet; general process of cheese manufacture; subsequent treatment of cheese; butter-making; creameries; "deep" and "shallow" setting systems; general process of butter-making; packing and preserving butter.

DEPARTMENT OF BOTANY AND PRACTICAL HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest; also a course of lectures on Landscape Gardening. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard; fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture; shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in in the work of laying out and plotting grounds topographically.

CHEMICAL DEPARTMENT.

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life. Text-book, Ganot.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blow-pipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

Are constantly in progress in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

DRILL IN ENGLISH.

"As grammar was made after language, so ought it to be taught after language."—*Herbert Spencer.*

Drill in English embraces the following topics:

Sounds of the language; drill in producing the vocal, sub-vocal and aspirate elements with accuracy, distinctness and volume; vowels, consonants.

Letters: Form; power; rules for spelling, drill.

Words: Signification, properties, modifications, variations, relation and dependence.

Sentences: Drill in statement of ideas; description, clearness, terseness, vigor; business letters, discussion; capitalization; syllabication; punctuation; construction and analysis of sentences; elements, uses and names; criticism of compositions printed as written; proof reading; grammatical construction; superfluous words and clauses; drill in reading, speaking and penmanship.

Text-books: Webster's Academic Dictionary; Lee & Hadley's Advanced Lessons in Language.

Pupils deficient in spelling, etc., should enter the printing class, the printing-office being the work-shop of language.

STRUCTURE OF ENGLISH.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

MATHEMATICAL DEPARTMENT.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

DRILL IN ARITHMETIC.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Following this line, the student, so far from hammering away at "pure" science draws from the mathematical store-house what he needs, and sees why he needs it. Accuracy of calculation and posting, rather than a *mere* comprehension of the principles, is aimed at. Besides the recitation-room drill in business forms, practice in the field is also given. Estimating the number of cords in a pile of wood said to be 100x4x4 feet is one thing; measuring a pile of wood through which any number of cats may be harmlessly thrown, and in which four-feet sticks are the exception, is quite another and more difficult thing.

ARITHMETIC AND BOOK-KEEPING

Is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides ensuring arithmetical practice, develops practical skill in that important art.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admiral system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study. In addition, constant practice in the application of lines to metal and wood is furnished in the Blacksmith, Carpenter, Turning, Scroll-sawing, Carving, Engraving and Printing shops, and to fabrics in the Sewing Department.

PRACTICAL GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the use of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

PRACTICAL SURVEYING.

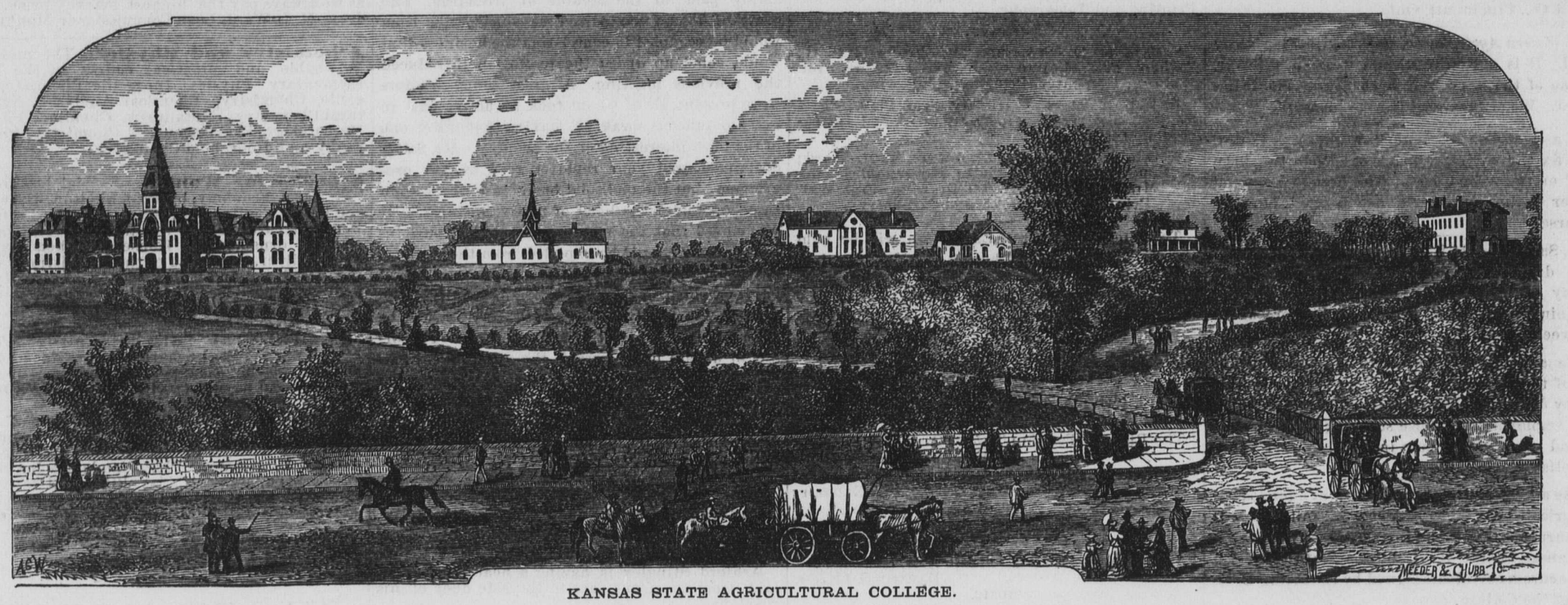
The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

STUDIES SPECIAL TO WOMAN.

FARM ECONOMY considers those affairs of the farm which usually come under the supervision of the farmer's wife or daughter, and which are not included in "gardening" or "household economy;" such as butter and cheese-making, dairy management, etc. A course of lectures is delivered by the Professor of Practical Agriculture. See heading, "Farm Economy."

GARDENING is included in Practical Horticulture. See heading, "Landscape Gardening."

HOUSEHOLD CHEMISTRY. See heading, "Household Chemistry."



KANSAS STATE AGRICULTURAL COLLEGE.

At first glance there appears a striking contrast in the two cuts of the College that appear in the INDUSTRIALIST. A slight examination, however, will show that the difference is due wholly to the principle of "perspective," applied to both space and time. In this cut the point of observation is outside of the College grounds, about six hundred yards from the line of the buildings; in time, the perspective is about three years from date.

This picture shows the plan upon which the improvements have been made during the last four years. The right wing of the main building has been erected, and is already occupied. It will cost about $50,000 to make the representation of the buildings and grounds in the cut a reality; and we confidently expect that sum of money will be appropriated by the next Legislature of Kansas.

But no adequate conception of an institution of learning can be obtained by a view of its buildings and grounds. We wish it were possible to present to our readers an interior view of the Agricultural College,—the good, honest work daily done in shop, office and class-room; the groups of earnest, thoughtful, sensible young men and women, as they now are, and what they will become two or three years hence, under the vigorous discipline of our industrial course of study.

THE INDUSTRIALIST

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Address A. A. STEWART, Manhattan, Kas.

Haeckel on Development.

We give below an extract from a critique on a recent work of Haeckel's which reviews quite sharply Virchou's objections to the theory of Development. We have nowhere seen a better explanation of the scope and present status of Darwinism:

Virchow practically demands that only those sciences should be taught to our youth which rest on an objective, or absolutely certain, basis, secured by the experimental method. The theory of Development has no such basis, hence it only constitutes a problem of research, and not material for instruction. Had he given a little closer attention to Haeckel's lecture, he would have seen that Haeckel himself points out in emphatic language that the theory he advocates is not capable, nor ever will be capable, of exact or experimental proof. The human mind knows no such thing as absolute. Even mathematical axioms, as Helmholtz correctly maintains, have only an infinite degree of probability for us. All knowledge, all science, is a matter of greater or less probability; and we must accept and teach that which to the best informed appears to be most probable. Provisionally we must adopt those theories which are most in harmony with facts. It is for this reason that our chemists teach the atomic theory, our physicists the undulatory theory of light, our astronomers the nebular hypothesis, although they are fully aware that the very existence of atoms and of an ethereal medium is as yet unproved. According to Tyndall, the foremost men of the age accept these theories because thousands of isolated facts are accounted for by them, and because they "trace out illuminated paths through what would otherwise be the most hopeless jungle of phenomena in which human thought could be involved." The same is true of Development, only that the phenomena here are so much more complicated than in the theories just mentioned that more time and labor will be required before they can all be properly classified and reduced to order. If some facts still remain unexplained, it must be kept in mind that they do not contradict the theory in any case. Amid all the countless and complicated details of comparative anatomy, the distinguished Carl Gegenbaur discovered not one fact opposing it. Biologists assure us of the same thing. Is it possible that this should be so were the theory false? Or is it probable that all those best informed in such matters should have adopted it, not as a traditional opinion, blindly imbibed in youth, but as an independent opinion based on a personal examination of facts bearing on the question, and even involving in most cases the very disagreeable process of unlearning hosts of false doctrines? If under such circumstances our leading naturalists have adopted the doctrines of Lamarck and Darwin, as not only one step, but a hundred steps nearer the truth than any opposing theory, then must these doctrines also be taught in schools, or else natural science must be altogether excluded from them.

Let us not be misunderstood. We do not advocate the introduction of text-books on Darwinism into primary or even secondary schools. Professor Oscar Schmidt, one of the first of the German Darwinists, rightly insists that the appreciation of these modern theories explaining the origin and development of living organisms requires more mature mental faculties than are to be found in such elementary institutes of instruction. What we do insist on is, that as soon as natural science *is* taught, it must be taught on the basis which is now accepted by the best authorities. But it must always be taught, not as absolute truth, but, as in the case of atoms and the ether, as the nearest *approximation* to the truth. Nothing is more injurious to the development and growth of the human brain than the overloading of it at an early age with dogmas, be they scientific or religious. The great object of education is to preserve the brain in a plastic condition, capable of receiving or originating new ideas and impressions; and this can be best accomplished by informing it at an early age of the relativity and uncertainty of human knowledge, not in a one-sided manner, as Virchow has done by singling out the theory of Development, but in a more just and comprehensive manner, by showing that the uncertainty also extends to the physical sciences, and still more to history, sociology, psychology, and so forth. With this understanding it will even be safe to teach the theories of spontaneous generation, and of Haeckel's "Plastidul Soul" and his "genealogical romance," without injury to young men or women. The scientific value of such brilliant efforts of the imagination much more than neutralizes the evil effects which Virchow fears will accrue to science by a loss of faith in it, should any of these speculations turn out to be incorrect.

No one can deny — and Virchow would be the last to do so — that Darwinism, as the only satisfactory method of accounting for organic development, has during the last two decades acted as one of the strongest ferments which have ever put life into stagnant human thought. The comparison between Newton and Darwin has been so often made as to have almost degenerated into a commonplace. The analogy, however, is closer than is commonly supposed. Newton annihilated space, Darwin time. Newton pointed out that the laws which guide a falling planet can be ascertained by studying the laws which guide a falling stone. Darwin showed that by observing the stages through which an individual passes in his embryonic growth, we get an epitome of the lower forms of animal life through which his ancestors have passed in their generic development in the course of ages. He, moreover, traced out and formulated the laws of nature by which this development was brought about — variation, heredity, adaptation, use and disuse, correlated growth, selection, etc., and thus supplied a new method of studying nature, "a new genus of thought," as a hostile witness, Max Muller, calls it, which it would be as irrational to keep from our higher schools as it would be to exclude from them microscopes, telescopes and spectroscopes. That fatal indifference with which American students are so often reproached can best be overcome by plunging them at once in this strong current of modern thought, and teaching them how to swim without being blindly carried along by the force of the current, as they certainly will be if they are not taught to swim in time. The great extent to which all modern literature, periodical and non-periodical, is spiced with evolution ideas will bring them into daily contact with these doctrines anyhow; and the only way to guard them from excess in any direction is to afford them intelligent and systematic instruction in these matters. —*The Nation.*

Need of Applied Science on the Farm.

Every successful farmer is, to some extent at least, a scientific one. The art of agriculture demands the aid, not of one only, but of many of the natural sciences — botany, vegetable physiology, geology, meteorology, chemistry, etc. With the aid of these one need not grope his way blindly in the dark. Numerous instances are on record where chemistry as applied to agriculture has produced marvelous results. A few years ago a farmer in Maryland whose land would barely reproduce the seed sown upon it, applied to a distinguished chemist, who, on analysis, detected the absence of but one element of fertility—phosphoric acid. That element being supplied by the application of a liberal top-dressing of finely-ground, raw bone meal, the product was fully twenty-nine bushels of wheat to the acre. But the chemist is not always as successful in his recommendations as to the best methods of increasing the productiveness of the soil. He has need of such ascertained facts as the practical farmer always has in store. These will enable the chemist to better direct his investigations. A certain amount of scientific knowledge on the part of the farmer is necessary in order that the co-operative relations existing between the man of science and the one of practice may be made more effectual. It has been said that every farmer is a practical co-operator. "He is in partnership with the atmosphere and soil. Like every partnership, it is a relation of trust and confidence; and, as in every partnership, the farmer ought to know the duties of the other members of the firm as well as his own. He should know the work assigned to each of his co-partners, and how they work, lest he may counteract their labors by his own; and he should also know when to rely on them and when not. More than all, when they call upon him for assistance he should know how to furnish it."

It is an astonishing fact, that in a country like this, where three-fourths of the population are engaged in agricultural pursuits, there are still more institutions devoted to education in medicine, law and commerce than there are to that art and science which underlies all other professions, one for which the least money is expended, and for which the least legislation is done. How few indeed are the agricultural colleges in this country where a young man can acquire the important art of becoming a truly intelligent and skillful farmer. True, we have theoretical teaching enough, but scientific facts are not as yet demonstrated to any appreciable extent by practical husbandry, or in such a manner as to show their superiority over the old way, or show that applied science will pay.—*Cincinnati Grange Bulletin.*

THE tenderfoot, or young man of leisure and with no means of support, who is waiting for something to turn up, the meanwhile living off the earnings of his widowed mother, rich uncle, tender-hearted aunt, or the family cheese, is a mean sneak of humanity in the eyes of the world. Such young men ought to look at themselves with eyes reversed, and see themselves as others see them: they would then in all probability make some effort to become men. No better opportunity has ever been offered persons out of employment than is offered now. Farms in the great west can be had for almost nothing by any one having a little chunk of the old-time grit and tenacity possessed by their grandfathers.

The useless young man of to-day can if he wishes be a rich and influential man inside of ten years, if he tries. There is no calling more noble, more elevating and more independent than that of the farmer. Geo. Washington said: "Agriculture is the most healthful, most useful and most noble employment of man."—*Spearville News.*

THE population of the State of Kansas of school age — that is, between the ages of five and twenty-one years — was, in 1877, 232,874, of whom 120,568 were males and 112,306 females. The same population, in 1878, was 266,575, of whom 137,302 were males and 129,173 females. Increase during the year, 33,701.

THE INDUSTRIALIST.

SATURDAY, MAY 24, 1879.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

Japanese Persimmon, Kaki.

Unless we are greatly mistaken, this much-puffed fruit belongs to the great class of horticultural humbugs, of which the "Russian apples," *Morus multicaulis*, and the "white willow" may be called typical species. We say this after having had a good deal of experience with the tree and its fruit in the land of the Rising Sun. What can be wanted of the persimmon in a country that can grow apples, peaches and pears as Kansas can grow them, is one of those vasty mysteries which we never expect to see solved, except by the nimble-tongued tree peddler. Why, an American would consider himself the victim of a practical joke, if he should be tempted to eat one of them! If picked before it is "dead ripe," its astringency will suggest the possibility of its puckering up the mouth of a cast-iron cauldron: when ripe it is, without, a leathery, tolerably firm skin; within, a little, sweetish, vapid fluid, some pulp, a half-dozen flat, hard seeds, and many strings of woody fibre drawn through all. The pawpaw or the lowly mandrake are fruits fit for the gods in comparison with the kaki.

Our advice to farmers and fruit-growers is, to severely let this foreigner alone. Let the nurserymen and tree peddlers make the "fortunes" that are to be made in the cultivation of this tree. But if you feel tempted to try the kaki, resist it for this once, and set out instead a few osage orange trees. These are much more hardy than the kaki, the tree is quite as handsome, and the fruit is about as good.—*Prof. Shelton.*

Do It.

One of the most useful articles a lady can have is a scrap-jar to stand by her sewing chair or writing table. Mine is a two-gallon pickle-jar that had been put among rubbish, because so badly cracked as to be unfit for holding liquids,—a coat of brown paint and pictures brightening it up, so that the once worthless jar is now an ornament. The pictures are put on with wheat flour paste, cooked until smooth.—*Exchange.*

This item is a fair specimen of the profound wisdom which adorns the usual "Ladies' Column" of patent sheets. It is grand. The light and elastic waste basket will now wander to the garret; and its place will be filled for a while by a heavy, ugly, old, two-gallon pickle-jar, so badly broken and cracked as to be unfit for holding liquids. Once worthless, that jar will now be an ornament. An indiscriminate collection of gaudy pictures, a spoonful of paste, and a cup of varnish, transforms it. Like a phenix, it raises from its ashes to proclaim to visiting artists, amateurs and enthusiasts that the house which they are honoring is the home of a lady of taste and refinement. Of course, it is not only that scrap pickle-jar, so ingeniously reconstructed and so admirably ornamented, that will testify to the above qualities of the lady. For years the busy editor of the "column" has been inventing similar patterns; and now the whole parlor — nay, house — is stocked with pickle-jars, ginger bottles, wax work and hair twists, picture-frame fixtures, autograph concerns, and shell structures. Unbounded success has crowned his labors in directing the female energy of the country to the proper channel. He deserves a monument of hair, wax and shell work, crowned with a pickle-jar "so badly cracked as to be unfit for holding liquids"!—*Prof. Walters.*

Requisites in Experimenting.

All practical knowledge is acquired, directly or indirectly, by observation and experiment. No truths in agriculture have ever been established by *a priori* reasoning. The mechanic could make no reliable estimate of the strength of materials without antecedent observation. We would have no improved vegetables and fruits, no Short-horns or Jerseys, had not civilized man acted upon the hints gained from experience. In chemistry and physics it may seem that man can reason from cause to effect, and thus attain results without the more laborious process of experiment; but all knowledge of the causes with which he deals must have been acquired by the most scrupulously accurate experiments. We owe the steam-engine, the telegraph, and the telephone to the arduous experimental labors of scientists. The properties of a chemical compound cannot be inferred from the known properties of the elements composing it. Carbon and nitrogen are necessary constituents of food; but when combined in certain proportions they form cyanogen, a very poisonous substance. Mercury and chlorine form calomel: if the amount of chlorine be doubled, we have corrosive sublimate.

Experiment has aptly been termed the language by which we converse with nature. If the question put to nature be pure and simple, her answer will be pure and simple likewise. If the question be mixed, the answer will be the same. It is important that this point be emphasized that it be thoroughly understood. Erroneous theories generally arise from this cause. In agricultural experiments several questions are often combined in one; and the experimenter is entirely ignorant as to which of the conditions was the producing cause. Owing to inattention to this, the great mass of agricultural experiments are the merest rubbish. To test the comparative value of a top-dressing for wheat, the farmer may plow this ground earlier to give time to apply the manure. He cannot tell to what extent the result has been affected by early and late plowing. If, in experimenting with potato eyes and sets, he also concludes to test planting in hills and drills, and then cultivate those in drills one way and those in hills both ways, he cannot possibly establish anything. To determine the assimilability of any particular form of plant food, all other forms of the element in question must be withheld. In deducing the laws of electricity or of magnetism, the closest attention to details is requisite.

The truly scientific mind will find no difficulty in all this. But this is an age when newspapers abound in accounts of experiments and the theories deduced from them. It is desirable that those who have not a scientific training should be able to analyze an experiment, and determine the conclusions to be legitimately drawn from it. Of course this requires, to a certain extent, a knowledge of the scientific principles involved; but it also requires the careful discrimination between simple and complex conditions insisted upon above. If those who experiment, and those who read accounts of these experiments, were able to thus discriminate, we should have fewer false theories in agriculture and in popular science.—*Prof. Failyer.*

In the article on sulphur and products, by Dr. Deite, it is stated that in 1875 the total yield of sulphuric acid in Europe amounted to 841,000,000 kilos., of which 500,000,000 fall to the share of England, 150,000,000 to France, 106,000,000 to Germany, 40,000,000 to Austro-Hungary, and 30,000,000 to Belgium.—*Exchange.*

Students Enrolled Since Jan. 3, 1879.

NAME.	COUNTY.
Adams, Emma L.	Riley.
Abbott, Frank	Riley.
Allen, Albert H.	Nemaha.
Allen, Chester	Mitchell.
Axtell, Frank D.	Pottawatomie.
Axtell, Fred W.	Pottawatomie.
Ayres, Sarah	Shawnee.
Barnes, E. M.	Osage.
Bates, Charles W.	Vermont.
Bayles, Benjamin B.	Riley.
Beacham, Augustine	Marshall.
Blain, Arthur T.	Riley.
Breakbill, John	Riley.
Buchli, Bartholomew	Wabaunsee.
Buell, C. Stewart	Riley.
Buell, Delight A.	Riley.
Call, Charles M.	Shawnee.
Call, Henry L.	Shawnee.
Campbell, Emma	Riley.
Campbell, Ettie A.	Riley.
Campbell, May	Riley.
Chenoweth, Charles C.	Cherokee.
Chenoweth, J. W.	Cherokee.
Clarke, Ezra S.	Riley.
Clarke, Hattie P.	Riley.
Clarke, Mary	Riley.
Coburn, Ella	Saline.
Coleman, Edward P.	Iowa.
Cowell, William J.	Clay.
Cox, George A.	Riley.
Cox, Lizzie R.	Riley.
Cripps, Edward V.	Riley.
Culter, Horace M.	Sedgwick.
Dickson, A. F.	Johnson.
Donaldson, Alvin	Butler.
Donaldson, Flora	Butler.
Donaldson, George	Butler.
Dow, George H.	Riley.
Durkee, Annette	Lyon.
Durkee, Orpheus	Lyon.
Eckman, Wilmer K.	Osborne.
Edmiston, Dora	Illinois.
Everhart, Logan W.	Labette.
Farnsworth, Henry E.	Lincoln.
Favour, William P.	Greenwood.
Flack, John B.	Dickinson.
Foreman, Albert M.	Riley.
Gist, John M.	Riley.
Gist, Joseph T.	Riley.
Glossop, Emma	Riley.
Goin, Edgar L.	New York.
Gordon, George A.	Jackson.
Griffing, William J.	Riley.
Gross, W. E.	Saline.
Hartmann, John D.	Dickinson.
Hicks, Wm. G.	Cherokee.
Himes, Hattie	Riley.
Hopkins, Harry H.	Butler.
Hotchkiss, Charles S.	New York.
Hoyt, Emma	Riley.
Hulett, C. M.	Johnson.
Humphreys, George	Sumner.
Hunt, Henry L.	Cherokee.
Hunting, Cora M.	Riley.
Hutsell, Sallie	Cherokee.
Jacobs, James H.	Cherokee.
Jaquith, Walter W.	Davis.
Jeffrey, William J.	Riley.
Jeffrey, Fletcher	Riley.
Jewell, Fred	Butler.
Kent, John H.	Riley.
Keyes, George C.	Wabaunsee.
Kingsbury, Eddie L.	Coffey.
Kinsey, Dora	Shawnee.
Knipe, George D.	Riley.
Knostman, Emma	Riley.
Leach, Darwin S.	Mitchell.
Lewis, Issie	Riley.
Lewis, Jno. W.	Riley.
Light, Willis	Neosho.
Limbocker, Clyde	Pottawatomie.
Limbocker, Clarence	Pottawatomie.
Luse, William P.	Missouri.
Lynch, Fred C.	Cherokee.
Lynch, James H.	Cherokee.
Mails, Mattie	Pottawatomie.
Mann, John	Rice.
Mason, Silas C.	Ottawa.
McBratney, William	Nemaha.
McGuire, Katie I.	Johnson.
McNair, Alice E.	Wabaunsee.
McNair, J. L.	Wabaunsee.
McNair, S. E.	Wabaunsee.
Messenger, Charles	Cowley.
Miller, Edgar	Davis.
Millikan, Minnie E.	Johnson.
Mills, Hattie L.	Missouri.
Moore, Thomas R.	Smith.
Morgan, S. M.	Lyon.
Morrow, John N.	Johnson.
Myers, Wirt S.	Allen.
Neiman, Charles	Nemaha.
Nelson, Cassius C.	Illinois.
Nelson, Henry	Ottawa.
Neusbaum, Ada A.	Riley.
Neusbaum, Lincoln H.	Riley.
Noland, Manda	Riley.
Noyes, Amy E.	Wabaunsee.
Noyes, Ida L.	Wabaunsee.
Outt, J. F.	Montgomery.
Paine, Edwin C.	Lyon.
Parker, Grace	Riley.
Peckham, Almira S.	Riley.
Pettit, D. C.	Cherokee.
Platt, Henry A.	Riley.
Platt, Jennie Smith	Wabaunsee.
Randel, Alta	Nemaha.
Randel, Charles F.	Nemaha.
Randel, Henry A.	Nemaha.
Records, C. M.	Chautauqua.
Reed, C. J.	Pottawatomie.
Reeve, Mark A.	Lyon.
Reynolds, Theodore	Riley.
Richards, Bettie	Pottawatomie.
Richardson, Noble A.	Wilson.
Robinson, Joseph N.	Shawnee.
Rose, George E.	Cherokee.
Rose, Wm. N.	Cherokee.
Rushmore. H. C.	Jefferson.
Rust, Charles	Atchison.
Salter, Lewis A.	Montgomery.
Shartell, Cassius M.	Chautauqua.
Short, Burton L.	Cherokee.
Sickels, Maria E.	Missouri.
Sigman, George L.	Chautauqua.
Sikes, Wm. H.	Pottawatomie.
Sloan, John A.	Clay.
Smith, B. B.	Dickinson.
Snow, Cora L.	Riley.
Spooner, Alice G.	Clay.
Stevens, James F.	Chautauqua.
Stiles, Charles H.	Wabaunsee.
Strong, Grace R.	Riley.
Tarrant, Will S.	Cowley.
Thackrey, Isaac	Riley.
Thackrey, Sarah	Riley.
Thompson, George F.	Cowley.
Ulrich, Cora L.	Riley.
Vaught, Cora	Butler.
Vincent, Ella E.	Riley.
Wahl, Charles A.	Indiana.
Wahl, Fred E.	Indiana.
Wahl, Wm. H.	Indiana.
Walters, Rosette	Davis.
Welch, C. R.	Harvey.
Welch, J. C.	Illinois.
Whaley, Rowena	Riley.
Whaley, Willie E.	Riley.
Whiteside, Wm. A.	Cherokee.
Wilson, Elmer E.	Cherokee.
Wilson, J. V.	Shawnee.
Winder, Ivaloo	Riley.
Wood, Clarence E.	Pottawatomie.
Woods, Albert O.	Sumner.
Woodworth, J. W.	Cherokee.
Wright, Robert H.	Ford.

THE INDUSTRIALIST.

SATURDAY, MAY 24, 1879.

The large amount of space given to the *Nationalist* report of the Commencement exercises, precludes the possibility of finding space for locals this week.

In concluding his address to the graduating class, Prof. De Motte intertwined, impromptu, with the subjects of the class orations, the following neat sentiment: "May all you 'Young Kansans,' not only in 'Woman's Work,' but in all work, bring to your aid, not only 'Two Elements of Progress,' but all elements of progress; so that 'As the Twig is Bent' toward 'Untrodden Paths,' they may not be forbidden paths; and so that, by the 'Force of (your) Ideas,' not only in 'The Solomon Valley,' but all over your State, 'The True Education' may be disseminated, until all the royal sons of your great commonwealth may be 'Men of Thought and Men of Action.'"

COMMENCEMENT EXERCISES.

We were unable to be present more than two or three of the examination days at the Kansas State Agricultural College this year, but with what we heard and what we saw were very much pleased.

The late rains helped to adorn the grounds in fresh apparel. The trees that were planted three years ago overshadow the walks and make going about the *campus* a very delightful thing. The shrubbery has made a growth such as Dame Nature vouchsafes to her children in Kansas; and the vines on the buildings have taken the motto of the students,— the ampelopsis saying to the rose and the rose to the honeysuckle, "higher, higher let us climb," until they are almost ready to look into the windows of the second story and nod approval to the wise sayings of the editors of that first-class paper, the INDUSTRIALIST, listen to the sweet tones from the music rooms, encourage the brave Mrs. Cripps in her arduous labors, or wonder at the click, click in the telegraph rooms. * * * We were in the Horticultural building one day last week, and heard a class of thirty in Botany reciting to Prof. VanDeman. The subject of the exercises was "Roses." Those who read, a week or two ago, the original and interesting article in the INDUSTRIALIST on this subject, by the teacher, will not be surprised when we say that we were greatly edified.

In the Laboratory, that same day, we found Prof. Failyer busy in the class-room with over fifty students, going through a review lesson on electricity. We had never before chanced to find this class in the recitation room, having usually been at the College in the hours when they were busy with the analysis or experiments. We never saw a class that could express its ideas more clearly and promptly than this; and each member seemed to show that respectful attention which is always so gratifying to find in the class-room.

The new building is very convenient for the purpose for which it was erected, and is a handsome structure of which, as a State, we may be proud. At the portal let all stop and admire the work of the Ulrich Bros., one of whom is a graduate of the College. The stone was dressed and cut after a design by Prof. Walters; and the rustic letters, "K. S. A. C.," and the date of the erection, is decidedly a work of art. On the first floor, besides the cloak-rooms and Prof. Shelton's, is the Secretary's room and the large library room with its antiquated volumes and Congressional Globes. To be sure, there are some fine books there, but they are mainly such as would suit only a Rip Van Winkle sort of a Regent or student. We did not see even so much as one late dictionary or encyclopedia; and it looked as though the Regents, or some one or some body, were afraid to let the students know what the world was doing in this age of progression.

From the windows, up stairs especially, that look towards the east and south, are the grandest and most charming views we have seen anywhere in the State.

We were in Prof. Ward's room one day last week, just as he was dismissing a class in Logic; and he was reading to them their grade for the year, not one standing less than ninety-two. Is it any wonder that Professors and students unite in saying we are doing honest, hard work here? On Tuesday of this week we spent an hour or two in Prof. Ward's room listening to the class in English Literature, and enjoyed every moment of the time spent there. We were pleased to see so many visitors in the class-room, many of them being some of the most intelligent and prominent people of our State. This class of Prof. Ward's acquitted themselves nobly. They took up the different eras from the time of Chaucer to the present, and discussed the different poets, essayists, dramatists, novelists and historians. And from the fourteenth century they mentioned most of the more prominent characters, with a brief sketch of their lives and the work performed by each. The class in Structure, by Prof. Ward, was also very interesting.

The drawings in Prof. Walters' room were very commendable. The designs, plans, surveys, etc., were executed in a workmanlike manner, and were really far more ornamental than some of the hideous "drawings" displayed by many an embryo artist.

Prof. Platt's classes all showed the patient, faithful work of the most patient and faithful of teachers. We were more than ever impressed with the greatness of the work done in this school. It is what it professes to be, a school for the masses. There are students from all over our State who, unless afforded just such opportunities as these, would be obliged to enter manhood and womanhood without sufficient knowledge and culture to make them useful to the world or endurable to themselves. We heard a dozen young ladies in Mrs. Cripps' department read essays and discuss the subject of home life in such a manner that we are fully persuaded that each one of these girls will make far better daughters, women, wives and mothers than they would without the wise instruction here received. These girls can all, when they leave the school, make their own garments and cook their own food. Indeed, some of them who are here from a great distance are already doing this, and doing it in a creditable manner. Some of the girls are motherless, and have never had home instruction; some have mothers either unable or too busy at other work to give their daughters these needed accomplishments.

Prof. Shelton's department we find not only in his room, but all over the broad acres of the College farm. His classes in Agriculture, Stock Breeding, Physiology, Hygiene, etc., all seem enthusiastic and deeply interested in the subjects before them. We saw the herd of pure-bred animals—Short-horns, Jerseys and Galloways — in the pasture as we went to and from the College. In the clover south of the College we saw the *solving of the problem* of raising cheap pork. Thirty pigs in three acres of alfalfa and clover — the pigs gaining marvelously and the clover gaining on the pigs! There seems to have been a wide experience with a number of "tame grasses" — orchard-grass, Kentucky blue-grass, timothy, alfalfa and clover. The corn, wheat, rye and oats looked well, as far as we could judge. Of the number of acres in each and the experiments made, we cannot speak, as we have not the statistics before us; but we are satisfied that no man could be doing better work in this position of farm superintendent and agricultural professor than Prof. Shelton has done and is doing.

The exercises at the Presbyterian Church on Tuesday evening were very interesting, although the large audience was disappointed in not having the Hon. W. W. Guthrie to speak to them. Beautifully arranged pot-plants and wreaths of evergreen adorned the west end of the church; and still greater beauty adorned the east side, where were arranged thirty or more of the young students in Prof. Platt's singing class. The music was the best it has been at any of the Commencement exercises for many years. We were especially pleased with the violin and organ duet, and with the solo and chorus. We are greatly rejoiced that we have amongst us so many really excellent young singers who are capable of giving the pleasure received by the friends of the College on Tuesday evening.

After the anthem, prayer was offered by Rev. Mr. Peck, of Lawrence, and the first address was by Mr. Johnson, of Hiawatha; subject, "The Natural Sciences in the Affairs of Life." We are sorry that our space will not permit an extended report of this lecture.

The next speaker was Col. Abernathy, former State Superintendent of Iowa; subject, "The Economic Value of Education." The battle against the appropriation of public money has had to be fought out all over our country. The speaker went back to the first laws made in New England (1642) in regard to the education of children, and spoke of the anxiety of this people always to educate the masses. But that in Kansas at the census taking of 1870, there were 24,550 persons who could not read or write, and 16,907 of these were adults. The commissioner of education at Washington, a few years ago, sent out questions to be answered by the proper authorities, and among them was this: "Do those unable to read show more skill as laborers, and how much more can they earn than those who can read?" The reply is, if the uneducated had had an education, they alone would have earned enough greater wages in one year to have paid for all the educational advantages of the State. One boy brought up in ignorance costs the State more than sufficient to educate twenty boys. The poor-house and the jail cost more than the school-house and the college. Ignorance and vice are hand in hand. The extraordinary progress in manufacture is owing to the scientific training of the proprietors and many of the workmen. The school children should receive, before they are fourteen years of age, the elements of science. The masses should be educated; our State should not make the mistake of England, which overlooks the poorer classes to better endow Oxford and Cambridge.

The Under-Graduates' Exhibition on Wednesday afternoon was the best ever given in Manhattan. It was much pleasanter on account of having it Wednesday afternoon than it could have been on Monday evening, as at first proposed.

The singing was quite superior to any we have heard before. There were no extravagant efforts after the unattainable in music, but the selections were in harmony with the occasion, suitable for the orchestra, and adapted to the voices of the singers.

"The Inaugural Address" of Lincoln was given by Edward P. Coleman, after listening to which we thought, if this is the ability to be displayed by the under-graduates, what may we expect from the graduating class in the evening?

Miss Emma Campbell's subject was "The Student," which was well rendered.

Miss Flora Donaldson, who is one of the quick, bright students of the College and of the world, we judge, gave John Quincy Adams' "The Right of Petition."

Miss Emma Glossop, subject, "No Shade no Picture," though lengthy, was listened to with marked attention. Her delivery was clear and distinct, and she did excellently.

There is something particularly graceful in the action and manner of Miss Emma Hoyt; and the selection of Whitelaw Reid's "Tribute to Bayard Taylor" was most appropriate for this speaker, and was given with a peculiar delicacy and tenderness suited to the subject and the eloquent words of the author.

Darwin S. Leach gave an essay on "Agriculture and the Mechanic Arts," by Bateman.

"Industry the Road to Prosperity," by John N. Morrow, was well given, and listened to with pleasure.

Miss Grace Parker gave a selection from Dr. Geo. Wilson's "Man and the Industrial Arts." This young lady is another student, like others who had before spoken, who has grown up in our midst, and in whose successes in College life we individually take pride and pleasure.

Noble A. Richardson delivered an address, "The Perpetuity of the Union," in a most earnest and eloquent manner.

"Genius and Study," by Wm. E. Whaley, closed the exercises for the afternoon.

Where all did so very well, there is no chance for comparisons. If the oratorical ability of this class of ten students is a specimen of their work in the College, we are sure that all must be most favorably impressed with the Institution.

The Presbyterian Church was crowded to its fullest extent, and many went away for want of standing room, on Wednesday evening, on the occasion of the Tenth Annual Commencement of the State Agricultural College.

The music was under the direction of Prof. Platt, assisted by Profs. Walters and Hofer, with Mrs. Fox as organist. The singers were selected from among the best of our city, famous for its high musical talent, and the music was listened to by the large audience with rapt attention.

The salutatory was given by Lewis A. Salter, son of ex-Lieut.-Gov. Salter; subject, "The Young Kansan." He appropriately opened his address by saying that these graduates were not here to display their ability as orators, but could better show the value of the training which they had received in the class-room, the workshop, or on the farm, than on the rostrum. He honored the *Alma Mater* that had educated the hand as well as the head and heart. He gloried in the profession which he had chosen, the independent life of a Kansas farmer. He was proud of the State which had already accomplished so much in so many grand achievements. Beside doing the hard work of fighting drought and chintz bugs and supplying the Rocky Mountain locusts with two years' rations, Kansas had earned the name of being the Eden of the West, and may yet be the Paradise of the World.

Miss Ella Vincent naturally and ably took up "Woman's Work." The time was when it was not considered proper for woman to have an opinion of her own, and if she did, and freely expressed it, she was sneered at as a "Blue Stocking." But that age, as well as the age when it was fashionable for women to look pale and delicate, had passed away. The earnest, thoughtful, healthy, brisk girl, who had her own mind, and could when occasion required it speak it to others, was the girl who won the good opinion of all. The women of this age have done a great work in opening the doors of schools and colleges to women. To Mrs. Phelps and Miss Emma Willard is due great credit for their labors in behalf of their own sex; and to their efforts is due a great deal for the position accorded to woman in seeking an education. One thing in life the other sex is always ready to accord woman,— to practice the economy for the household. "It is such a saving if a woman can be her own milliner and dress-maker." We think it would be "such a saving" if every man would make his own hats and coats. This characteristic address was closed with a tribute to Margaret Fuller and a record of the labors of the wife of Senator Wade, who was her husband's secretary, and hunted up authorities for him when he was writing his speeches.

Harry C. Rushmore's "Two Elements of Progress,"— Industry, the least understood and most abused in this day of war between labor and capital, and Education, the keystone in the superstructure of our Republic,— was an address that would have done credit to a man of larger experience and maturer years.

Miss Ettie Campbell gave, upon the subject, "As the Twig is Bent," a womanly address on the value of so educating the young that all the dormant energies of the mind will be awakened, and the man or woman show the culture and care received in early life.

Wm. H. Sikes took "Untrodden Paths," and after going rapidly through the paths of science already known, predicted the wonders of the discoveries in the years to come; among which might be a force in nature that would so surpass anything now that there will be a new method of transportation which will be to the iron horse what it was and is to the ox team.

"The Force of Ideas," by Clarence E. Wood. Decline, stationary and progress: the last every nation seeks to perpetuate, but the first two they each and all as assiduously seek to avoid. Ideas, not sword or sceptre, rule the world. Though we of America are apt to look with distrust on the man of ideas, and call him visionary, yet he is the one the world cannot afford to do without.

"The Valley of the Solomon," by Wilmer K. Eckman, was a prose poem describing the glories, the beauty and fertility of that part of our State through which runs the river that gives the valley its name; and hinting to all the world that it would be well for it to come and settle on the six million acres there waiting to yield forth its fruit in its season.

Corwin J. Reed gave the next address, "The True Education,"— the gathering together of that which will make life full of happiness and prosperity. The liberal education — that which will help one to follow some trade or some employment besides the lowest and most uninteresting. The seeking constantly for higher thoughts instead of lower thoughts, which is the real source of true culture, which, of itself alone, is culture and true education.

The valedictory, by Arthur T. Blain, was a terse, eloquent and interesting address — "Men of Thought and Men of Action." In every nation the men may be divided into these two classes: men of thought and men of deeds. To the first class belong men of science; to the second, the self-made men, artisans, and so-called working-men. In the earlier ages the educated man was scarcely tolerated, and it was dangerous to know more than the masses: torture and death awaited many who sought to uplift humanity. Gradually this spirit has died out, and to unite the two elements is the desire of every nation. Examples of each class were given in the brief narrative of such men as Milton, Franklin, Oliver Cromwell and Abraham Lincoln. Men of action, without education and with but few opportunities, have achieved great success, but with the mental culture they could have achieved the same or greater work in less time. We, as a class, have finished our preparation for the active labors of life; and, in behalf of the class, I thank the Regents for the opportunity that has been given us, and hope that they will find a partial reward in our success. A noble tribute was offered to "the absent President, patient and kind, for whom each and all have a deep affection which time cannot destroy. The Professors we shall remember with heartfelt gratitude, for the benefits they have bestowed upon us. Our fellow-students who are to follow, we would encourage to renewed diligence and greater efforts. It is with mingled feelings of joy and grief that we go out into what is to us a new world, and leave behind teachers, classmates, old habits, and former pleasures. We trust that our lives will do honor to our *Alma Mater*, and that others, seeing the benefit we have derived, may seek to enter her walls, and also praise her by their works."

The diplomas were presented by the acting President, Prof. Ward, in a few well-chosen remarks.

The class was addressed by Prof. De Motte, of Bloomington, Ill., who closed his peroration with a wonderful sentiment offered to the class, in which he twined together the subjects on which each member had just spoken.

The degree of Master of Science was conferred on George Failyer and Wm. Ulrich, at which deserved honors every heart rejoiced.

The exercises closed with music and the benediction, and the audience dispersed, after heartily congratulating graduates, Professors and Regents for the grand work done during the past year.— *Nationalist.*

RAILROAD TIME-TABLE.

KANSAS PACIFIC RAILWAY.

PASSENGER ARRIVES.

No. 2, going East	11:14 A. M.
No. 4, going East	3:47 A. M.
No. 1, going West	5:10 P. M.
No. 3, going West	4:33 A. M.
No. 7 (freight), going West	8:15 A. M.

Nos. 1 and 2 run daily; Nos. 3 and 7 run daily except Monday; No. 4 runs daily except Sunday. Passengers with tickets are carried on No. 7.

GEO. C. WILDER, Agent.

THE INDUSTRIALIST.

SATURDAY, MAY 24, 1879.

Industrial Education.

The real value of an education to the student depends upon two things: First, the practical worth of the knowledge taught; and, second, the degree in which he makes it his own. Hence, the ability of any institution to give a practical education depends upon the kind and aim of the knowledge it teaches, and upon the thoroughness of the instruction therein. The State Agricultural College was directly endowed by Congress, and is guided by the State, for the specific purpose of furnishing to the industrial classes of Kansas a "practical" education, that is, "one fit for use." As its name indicates, and as the statistics of the industries of the State require, its chief work must be that of giving a useful and usable education to those who will engage in farming; and, therefore, the Farmer's Course must, from the nature of the case, be its main one.

FARMER'S EDUCATION.

Words and figures are merely instruments with which to record ideas. They are not themselves ideas, nor should they be made the chief end of an education. As a wagon is necessary to haul grain, so are they a necessary part of an education; but as the wagon is not the grain, so they are not the knowledge which the farmer converts into money. Hence, the classics and higher mathematics are not taught. But it will be noticed in the following course that so soon as the pupil acquires working skill in the use of the English language as a tool, and of figures and lines as mathematical tools, those arts and sciences which present knowledge that has a cash value to the farmer are taught as rapidly as their importance and thorough acquisition will permit. Studies numbered (1) and (4) in the second, third and fourth years are the spine of the course, to which the others are as ribs and muscle.

FARMER'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Practical Agriculture (advanced.)		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	
3. Polit. Economy, Practical Law.		3. Practical Geometry.		3. Algebra.		3. Industrial Drawing.	
4. Zoology.		4. Horticul., Landscape Gardening.		4. Practical Agricul. (elementary).		4. English Structure.	
5. Agricul. Chemistry	Meteorology.	5. Organic, Analytical Chemistry.		5. Physics.		5. Adv'd Arithmetic, Book-keeping.	
6. Logic.		6. Practical Surveying.		6. Industrial Drawing.		6. U.S. History, Industrial Drawing.	

WOMAN'S EDUCATION.

Nearly one-half of our students are females, and the Woman's Course is prepared expressly for their liberal and practical education. We have no doubt whatever that practical men and women, who understand what it means and what it seeks to do, will fully endorse it.

WOMAN'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Farm Economy, Special Hygiene.		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	
3. Polit'l Economy, Practical Law.		3. Industrial Drawing.		3. Algebra.		3. Industrial Drawing.	
4. Zoology.		4. Horticul., Landscape Gardening.		4. English Literature.		4. English Structure.	
5. Phys'c'l Geography, Meteorology.		5. Organic, Household Chemistry.		5. Physics.		5. Adv'd Arith. Book-keeping.	
6. Logic.		6. Household Economy.		6. Industrial Drawing.		6. U.S. History, Industrial Drawing.	

MECHANIC'S EDUCATION.

Because of the adaptedness of the leading course to the wants of the intelligent mechanic, it has been found practically unnecessary to diverge from the Farmer's Course. Additional studies, specially adapted to the mechanic's use, will be furnished in a Post-Graduate's Course.

If it be urged that the distinctively agricultural knowledge taught in the Farmer's Course is not directly valuable to the mechanic, we reply that, admitting the point for the purpose of argument, yet: 1. This knowledge is of more practical value to the mechanic than is the Latin, Greek, or a half dozen other things embraced in the usual course preparatory to the professions; 2. That the great majority of Kansas mechanics will also be more or less engaged in agriculture; 3. That those studies in the course which are directly valuable to the mechanic, together with the shop facilities, offer a better mechanic's education than can be elsewhere found west of the Alleghanies.

INDUSTRIAL DEPARTMENTS.

Having knowledge in the head is one thing; ability to use it with the tongue, fingers or feet is quite another thing. Both are vital to success in practical life. A man might thoroughly understand the theoretical principles of carpentry, and yet, not having used the tools, be wholly unable to earn carpenter's wages. So in all other vocations. Accordingly, instruction is given in the following well-equipped Industrial Departments, and every student is required to recite in some one of them, as selected by the pupil or parent:

FOR MALE STUDENTS.	FOR FEMALE STUDENTS.
The Farm.	**Dress-making.**
The Nursery.	**Printing.**
Carpentry.	**Telegraphy.**
Cabinet-making.	**Scroll-sawing.**
Turning.	**Carving.**
Wagon-making.	**Engraving.**
Painting.	**Photography.**
Blacksmithing.	**Instrumental Music.**

Each of these departments is conducted exactly as in daily life, and aims to give precisely the drill received by an apprentice. No charge is made, either for tuition or material, from male students taking the Industrials provided for them; nor from female students taking the ones provided for them, except in Instrumental Music. Male students taking either Printing or Telegraphy are charged $1.00 per month for the use of instruments and material.

DEPARTMENTS OF INSTRUCTION.

DEPARTMENT OF AGRICULTURE.

PRACTICAL AGRICULTURE.

Second Year:—General principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage.

Fourth Year: General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of a rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farmhouses; barns.

FARM ECONOMY.

Woman's Course, Fourth Year: Dairy products as human food; influences affecting character of milk; manufacture of condensed milk; the factory system and household plan of cheese-making; treatment of rennet; general process of cheese manufacture; subsequent treatment of cheese; butter-making; creameries; "deep" and "shallow" setting systems; general process of butter-making; packing and preserving butter.

DEPARTMENT OF BOTANY AND PRACTICAL HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest; also a course of lectures on Landscape Gardening. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard; fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture; shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in in the work of laying out and plotting grounds topographically.

CHEMICAL DEPARTMENT.

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life. Text-book, Ganot.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blowpipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

Are constantly in progress in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

DRILL IN ENGLISH.

"As grammar was made after language, so ought it to be taught after language."—*Herbert Spencer.*

Drill in English embraces the following topics:

Sounds of the language; drill in producing the vocal, sub-vocal and aspirate elements with accuracy, distinctness and volume; vowels, consonants.

Letters: Form; power; rules for spelling, drill.

Words: Signification, properties, modifications, variations, relation and dependence.

Sentences: Drill in statement of ideas; description, clearness, terseness, vigor; business letters, discussion; capitalization; syllabication; punctuation; construction and analysis of sentences; elements, uses and names; criticism of compositions printed as written; proof reading; grammatical construction; superfluous words and clauses; drill in reading, speaking and penmanship.

Text-books: Webster's Academic Dictionary; Lee & Hadley's Advanced Lessons in Language.

Pupils deficient in spelling, etc., should enter the printing class, the printing-office being the work-shop of language.

STRUCTURE OF ENGLISH.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

MATHEMATICAL DEPARTMENT.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

DRILL IN ARITHMETIC.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Following this line, the student, so far from hammering away at "pure" science draws from the mathematical store-house what he needs, and sees why he needs it. Accuracy of calculation and posting, rather than a *mere* comprehension of the principles, is aimed at. Besides the recitation-room drill in business forms, practice in the field is also given. Estimating the number of cords in a pile of wood said to be 100x4x4 feet is one thing; measuring a pile of wood through which any number of cats may be harmlessly thrown, and in which four-feet sticks are the exception, is quite another and more difficult thing.

ARITHMETIC AND BOOK-KEEPING

Is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides ensuring arithmetical practice, develops practical skill in that important art.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admiral system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study. In addition, constant practice in the application of lines to metal and wood is furnished in the Blacksmith, Carpenter, Turning, Scroll-sawing, Carving, Engraving and Printing shops, and to fabrics in the Sewing Department.

PRACTICAL GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the use of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

PRACTICAL SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

STUDIES SPECIAL TO WOMAN.

Besides the studies already indicated, attention is called to the following:

SPECIAL HYGIENE.

As shown in the course, one term is devoted to the study of Physiology, from the text-book of Dr. J. C. Daiton. This is followed in the fourth year by a course of lectures to young ladies by Mrs. Cripps on the subject of Hygiene, embracing such instruction in hygienic matters as are valuable to woman.

FARM ECONOMY considers those affairs of the farm which usually come under the supervision of the farmer's wife or daughter, and which are not included in "gardening" or "household economy;" such as butter and cheese-making, dairy management, etc. A course of lectures is delivered by the Professor of Practical Agriculture. See heading, "Farm Economy."

GARDENING is included in Practical Horticulture. See heading, "Landscape Gardening."

HOUSEHOLD CHEMISTRY. See heading, "Household Chemistry."

HOUSEHOLD ECONOMY

Follows Household Chemistry and consists of lectures by Mrs. Cripps on the art of house-keeping, embracing cookery, domestic management, and kindred topics. Many elderly gentlemen sufficiently know, and more young gentlemen will duly discover, that systematic knowledge of how cooking ought to be done is luminously different from the ability to do it. Instruction without practice can effect but little. Accordingly, a kitchen laboratory has been completely furnished, and affords every facility for drill in the art of cooking. This drill chiefly differs from that of a kitchen in the respect that after a girl has learned to wash dishes or pare potatoes she is not kept everlastingly at either. After full trial, we have found it just as feasible to give this practice, with profit and pleasure to the pupil, as it is to give laboratory practice in chemistry,—and no more expensive.

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Address A. A. STEWART, Manhattan, Kas.

The President of the Agricultural College.

The Board of Regents now in session at Manhattan are expected to select a President to fill the vacancy of Jno. A. Anderson—now a member of that promiscuous assemblage in Washington we call Congress. A number of names have been suggested from among our own citizens; viz., Gov. Geo. A. Crawford, Dr. Chas. Reynolds, Rev. Monjeau, and others. Outside the State a number of gentlemen have notified the Board of their willingness to accept the position. If it is found necessary to leave Kansas to secure a President, a man should be selected who will bring to the institution the prestige of a national reputation. One other point we believe of more than passing importance, and it is that the College should be as far removed from a sectarian religious government as possible. If a minister is selected for the Presidency from the Methodist Church, there will be more or less feeling by the other denominations, whether groundless or not, that the College is in the hands of the Methodists; and the same will be true in regard to other denominations, if the head of the institution is taken from their ranks. We believe that ordinary observation of the workings of our public institutions of learning indicate the necessity of their being free from the government or special influence of one religious denomination. There is nothing in this that is intended to be antagonistic to religious institutions, but the policy adopted for our public schools is a subject for discussion by the people.

The selection of a President for the Agricultural College is one of more than ordinary difficulty. The field is new. and experimental, surrounded by difficulties, and lacking the precedents and routine of the ordinary classical schools and the colleges. The President must be an educator, and a man able to meet the practical difficulties to be found in solving the problem known as industrial education. The task of the Board of Regents is no slight one.—*Topeka Capital.*

The Probabilities of a Dry Season.

So far as memory serves in respect to previous dry seasons, and so far as one can read the signs of the coming summer, the indications are strong for a dry and fruitful season, like 1870, '71 and '72, but not so hot, dry and destructive as 1874. There is little dew and less fog, and mould and mildew are absent to a surprising degree. A light rainfall, accompanied with sustained summer heat, admits of the ripening of a good winter wheat and spring grain crops—always providing both have a good start. A dry season is very advantageous to Indian corn, as 1870, '71 and '72 were—the corn crop in those three years giving a yield per acre hardly ever before known. If the good of the corn crop was not the first consideration, everybody would now be wishing for more rain, to benefit the winter wheat, spring grain and grass, and the successful fertilization of the fruit bloom. But more rain than enough to wet the ground six inches down would be a calamity, for it would reduce the corn acreage by deferring seeding so late that it would be impossible to get a "good stand." A warm, dry season means a year of great crops.

But what of great grain crops in Illinois? Does it not mean equally great crops elsewhere, so that prices will sink below the cost of production? I think not. Since and including 1875, the black soil prairie portions of Illinois have had four years of exaggerated rainfall, which have reduced their crops fully one-half. At the same time portions of Iowa, all Nebraska and Kansas have had just about the right quantity, and in consequence have made enormous crops. Now, if we go back and observe that the grain crop years of 1870, '71 and '72 were so dry in the States west of the Mississippi and south of the Missouri rivers that grain crops were a comparative failure, we shall have sufficient evidence to convince us that a rainy summer in Illinois means a dry one in the farther west; while on the other hand, dry and warm (fruitful) years in Illinois mean drouth and crop failures in the States named. There are reports of a general state of drouth in upper Wisconsin, Minnesota, Missouri, Kansas and Nebraska, which, for the time of the year, is exceptional and alarming. There is more than a reasonable probability that if Illinois continues dry as the season has begun, the losses from drouth west and north of it will become of national importance. The similarity between the winters of 1874–75 and 1878–79 having been maintained with more or less accuracy all the way through, and, in a measure quite as marked, the springs of 1875 and '79 having sustained the resemblance, it is probable that the parallel may go on into the summer. In that event we shall have rain in May, more in June, increasing in July, and the *maximum* will not be reached until after the highest range of summer heat in August. But this would be giving the black soil counties five rainy summers in succession, when under the rule of the common law of the seasons, we are entitled to only three or four; and it would also give another crop year to Kansas.—*B. F. J., in Country Gentleman.*

Breadstuffs in Europe.

In Algeria and Spain crops are reported to be doing well. Belgium and Holland have had good weather, but France, on the other hand, complains of rain. In Egypt the bean crop was ready last month in some districts, and the wheat will be ready in May. Advices from India would seem to indicate only a moderate crop. Germany is bare of grain for export. Hungary has enough for home use and for Austria, and a good surplus for export. The indications for the coming crop are good. Shipments of grain from Russia are only moderate. *London Miller*, in relation to stocks of wheat in England, says:

"We have now before us the lists of the grain stocks just collected in London, Liverpool and some other ports; and these turn out at the end of the year's first three months to be considerably reduced from the total held on the first of January, whilst the bulk of wheat in six ports, only 663,700 qrs., is but a little more than half the quantity in hand a year ago at this date. This result was expected, as granary keepers have lately much complained of their empty floors. It is also explained by the last eight months' wheat imports (large as they have appeared), being about 500,000 qrs. below the receipts in the same period last season. As a set-off, English deliveries at market have been 1,000,000 qrs. in excess; and these home supplies have in reality ruled the market. In London the flour stocks, 152,350 barrels, 142,490 sacks, compare with a rather lesser quantity held on April 1, 1878, and are also rather increased from the bulk held three months ago."

The *Mark Lane Express* of May 6th says:

"The wheat plant has improved. The prevailing depression caused farmers to draw largely on their reserves of wheat, and supplies at provincial markets were very much more liberal than they would have been had the necessity to realize been less pressing."—*Prairie Farmer.*

AT par—knowledge that will enable us to labor more intelligently, so that farming may be made more profitable than at the present time.

Shall and Will.

Some time since we gave an illustration of the difference in the use of the future tense, when expressing the two ideas of *fact* and *determination*. The following is the conjugation of the verb *go* in the future tense:

Fact.	*Determination.*
I shall go,	I will go,
You will go,	You shall go,
He will go.	He shall go.

That is, when we would express simply a fact, *shall* is employed in the first person and *will* in the second and third. But when we would express determination, the arrangement is reversed; *will* is employed in the first person and *shall* in the second and third.

The word *shall* is derived from the Saxon word *scealan*, signifying *ought*. This, with the infinitive, makes the future tense.

The original form of *I shall go* was *I shall to go;* that is, I *ought* to go; it is my *duty* to go.

Substituting this in the above form, we have:

Fact.	*Determination.*
I shall to go,	I will to go,
You will to go,	You shall to go,
He will to go,	He shall to go.

An expression indicates a fact or a determination according as it does or does not express determination on the part of the speaker. When we say *I will to go*, it indicates a determination to go. When we say *you* or *he shall to go*, then it is a determination that *you* or *he* ought to go; and it implies some authority or power over the individual addressed or spoken of.

The past tense of shall is *should*; of will, *would*. These undergo the same change respectively as their present tenses.—*North Topeka Times.*

Our Exchanges.

Whenever a new and startling fact is brought to light in science, people first say, "It is not true;" then, that "it is contrary to religion;" and, lastly, that "everybody knew it before."—*Agassiz.*

The present outlook for a full crop of fall wheat is not good. The dry weather probably retarded its growth some, but the severe frosts in April, and the destructive hail-storm of a few weeks ago, have shortened the crop many thousands of bushels in this section. Spring crops are reported to be doing excellently; and we look for a big yield of corn and potatoes.—*Sterling Bulletin.*

The extreme southwestern portion of Kansas, which appears on the old maps of the United States as the very heart and center of the "Great American Desert," has just been visited again by copious and refreshing rains; and our accounts from that part of the State say the prospect is excellent for fine crops of wheat, corn and other grains. The enterprise of the American people has demonstrated that the Bible figure of causing the wilderness to blossom as the rose is not purely figurative.—*Leavenworth Times.*

The misfortune of having no railroad was never more plainly apparent than it is now. Lots of country produce exists in the county for which no market exists. The town dealers dread to see it come in, and in some instances refuse to take it from the fact that it cannot be profitably reshipped. We would gladly give some market reports for our own town, but there is no market here. A railroad is coming, and others are in contemplation. The question is, which line shall the county support if left free to choose?—*Eureka Graphic.*

THE INDUSTRIALIST.

SATURDAY, MAY 31, 1879.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

Announcement.

The next number of the INDUSTRIALIST will be issued on June 28th, and the next following upon July 26th. In other words, during the next two months — the major part of the College vacation — this paper will be a monthly.

It may not be amiss for us to state briefly the reasons for making this change. During the College year the work on this paper is done chiefly by the printing class: indeed, one of the useful objects subserved by the INDUSTRIALIST is in furnishing to the students in printing practical work in a regular printing-office. During the next three months our "working force" will be scattered far and wide over the prairie farms of this broad State; and to issue the INDUSTRIALIST during this time will compel the employment of extra help, for which we are hardly prepared. Again, our constant aim has been to lay before our readers, from week to week, the work of the Agricultural College. Locals are the soul of a newspaper; and especially is this true of a newspaper occupying a special field, as does the INDUSTRIALIST. Of course, with students — and, to some extent, teachers — dispersed over the State, there is nothing to write about; and thus the chief reason for the existence of the INDUSTRIALIST is removed.

These, briefly, are our reasons for "easing up" with this paper during a portion of the vacation; but on August 2d the INDUSTRIALIST will resume its weekly gait, and will have more than ever to say of agricultural and educational matters, and especially of our Agricultural College.—*Prof. Shelton.*

THE sale of Short-horns advertised for some time past in these columns, was in all respects a very great success. The Leavenworth *Times* sums up the result as follows: "The total number of head sold, 80; total amount, $14,695; average on the heifers, $204.69; average on bulls, $133 and a fraction; average on entire stock, $196." You see it pays to advertise in the INDUSTRIALIST.

THE Governor and Council of Massachusetts are in favor of turning over the Agricultural College of that State to Amherst College.—*Lawrence Journal.*

If this item means that the people of Massachusetts are dissatisfied with their Agricultural College and propose to incorporate it with one of the older institutions, we offer the suggestion of the lady who hands us the item: "Let the Massachusetts College folks follow the Kansas plan, and give a sensible, practical, industrial education." This we have found to be the most effectual way to head off consolidation notions.

The State Horticultural Society.

Secretary Brackett, in a circular just received, informs us that the next (ninth semi-annual) meeting of the Kansas State Horticultural Society will be held at the city of Beloit, Mitchell county, on June 17th, 18th and 19th. Reduced rates are offered on all the railroads, and the good people of Beloit promise free entertainment to all attendants. The meetings of this wide-awake Society are always "proper good places" for the lovers of the "art which doth mend nature;" and every one who carries a pruning-knife will find it greatly to his advantage to be there.

The Past Year.

The whole number of students enrolled during the past collegiate year has been 208, of whom 167 were males and 41 females. The attendance during the fall term was 170; during the term just closed, 167. One hundred and thirty-three (133) were enrolled both terms of the year. The number remaining through the whole year was 110. Forty counties of Kansas have been represented in the Agricultural College this year, and seven other States; but of the fifteen young men credited to other States, nearly all of them will make their future homes in Kansas.

At the commencement of the year the fourth-year class consisted of ten young men and two young women; but for various reasons three of the young men were obliged to leave the College, reducing the graduating class to nine,— the same number that graduated in 1877. The class of 1880 is still larger.

At the opening of the fall term a large number of the new students were found able to take up the studies of the second year; and this class is the largest one in the Institution,— the class in Practical Agriculture the last term numbering over forty. Nearly all of those here this term intend to return. The prospects for another prosperous year are flattering.—*Prof. Ward.*

School Books.

By the provisions of a law passed last winter, the district boards in each of the 5,136 school districts of this State must decide, before Sept. 13th, 1879, what text-books shall be used in their respective schools during the next five years, or five years from the time of the previous adoption of any series. A failure to comply with the law is made a misdemeanor, and subjects the parties convicted thereof to fines or imprisonment.

A circular, addressed to school-district officers, has recently been issued from the State Department of Public Instruction, which explains the provisions of the law, and also contains a list of books selected from twelve different publishing houses, for the consideration of the district boards. In this list there are six different series of readers, and three each of grammars and arithmetics. This list is a good one; and, as the books named and many others are in use throughout the State, each district should have the privilege of adopting those already in use, or that can be procured with least expense. The long list, however, will appall many a district board; and a carefully selected series of text-books, covering all the subjects taught in the district schools, would relieve them of a responsibility which they feel unable to meet. Could not such a list be made out and recommended by the State Teachers' Association, at their next meeting in Lawrence.—*Prof. Ward.*

Letter from an Old Student.

In a letter, dated Smith Center, May 25th, to a member of the Faculty, T. J. Wyland says:

"My brother and myself have four hundred acres of land, and that of the best quality. We built a house on the line, and are 'baching it;' and although it is a rough way of living, we can afford to do it for a while." [Of course you can, boys.] "T. R. Moore visited us yesterday, and staid all night. He has a claim a few miles from ours. He is teaching school this summer. He obtained an 'A grade' certificate, and feels quite well over it." [We know he deserved it.] "He thinks of going back to College and completing the course." [Sensible.] "I have thirty-two acres in corn and eight in wheat. The crops here look well, especially the wheat. Besides cropping and cooking, I have put out several thousand forest trees and one hundred apple trees. I have a peach orchard started, and various kinds of berries. After I left College, until the spring work crowded, I had a good time reading. For the last two months I have been too busy to read much, but am reading Holmes' Poems at odd moments, and enjoy them very much."

Mr. Wyland has been a member of the Agricultural College for two terms; and is a representative of a large class of young men who go forth from this Institution, not as graduates, but as earnest students, knowing how to relieve the drudgery of daily physical toil by a constant intellectual growth. Let us hear from you again, Thomas; and to our students all over the State, we extend a cordial invitation to write.—*Prof. Ward.*

Artichokes.

A correspondent who has not tried artichokes as a pig feed, but who is strongly prepossessed in their favor, writes requesting that we will give the readers of the INDUSTRIALIST our views on this subject. We confess in the outset we do not share our friend's enthusiasm as regards this succulent tuber. Artichokes may, and doubtless do, make a good deal of feed; but this is not the question. No thoughtful farmer would invest in any crop for this reason alone. He grows if possible the best of a given class of crops, taking into account all the conditions which surround its growth,— the amount yielded, cost of production, ease in harvesting, and many other details.

A point often strongly urged in favor of artichokes as a hog feed is, that they require no harvesting, the pigs doing this work of their own volition. This is to us a most serious objection to their use. Hog power, or the power of any animal kept for its flesh or milk, is the most expensive force that the farmer can employ. Farmers should always bear in mind that animal force is yielded at the expense of tissue; and when the hog works either at rooting or racing over fields, this work is paid for in pork.

Even if we grant that artichokes are a valuable feed during the winter months, they would be useless to most farmers. Those farmers who make the most of their pigs "ring" them in the spring, before turning them into the fields; and such pigs would be quite incapacitated for artichoke harvesting during the remainder of their lives. We well remember passing, some years ago, a small field of artichokes which was evidently being "hogged" after the most approved style. Huge mounds of earth alternated over the entire field with abysmal excavations; and the field had the appearance of having been acted upon by a very energetic earthquake.

We hesitate not to say that the farmer who expects to grow rich by raising artichokes and harvesting them by "hog power," will be grievously disappointed. Better far, seed a field to clover or alfalfa; and, after ringing the pigs, turn them loose in this as a summer range. These clovers are much more nutritious than watery artichokes, the yield is larger, and the cost of harvesting much less. Again, the artichoke is a weed of the largest proportions; and, when once in possession of the soil, it will survive the oldest inhabitant himself.—*Prof. Shelton.*

AMERICA sends more students to Leipsic than any single European nation excepting Austria.

The Times Still Ahead.

A statement showing the amount of postage paid by the different daily newspapers of Kansas.

[From THE TIMES, Nov. 28, 1878.]

It is the plain duty of THE TIMES to give the public, and particularly our advertising patrons, the facts concerning its circulation, in order that they may fully appreciate its value and importance as an advertising medium.

The surest way to obtain the exact circulation of the papers of the State outside of the counties in which they are published, is from the amount of postage paid by them to the Post-office Department.

Below we give the amount paid by THE TIMES, taken from the post-office receipts of this date.

The amount paid by other papers in the State is taken from the Atchison *Champion*, which claims to have the amount from official sources, and being published in its columns is evidence that it accepts it as correct so far as it is concerned.

THE TIMES, Leavenworth, Kansas	$882.96
Champion, Atchison, Kansas	336.36
Commonwealth, Topeka, Kansas	302.12
Patriot, Atchison, Kansas	112.26
Blade, Topeka, Kansas	107.36
Public Press, Leavenworth, Kansas	102.00
Monitor, Fort Scott, Kansas	73.40

From the above it will be seen that THE TIMES pays more than double the postage of any other daily paper in the State.

THE TIMES pays more postage than any other two daily papers in the State.

THE TIMES pays more postage than any other three daily papers in the State.

THE TIMES pays more postage than any other four daily papers in the State.

THE TIMES, after deducting the amount paid for postage by all the other daily papers in the State upon their exchange list, *pays more postage on its bona fide circulation than all the other daily papers in Kansas.*

Address D. R. ANTHONY,
Leavenworth, Kansas.

THE INDUSTRIALIST.

SATURDAY, MAY 31, 1879.

The grades for the last two months of the term will be forwarded soon.

Among recent stock sales we have to report the sale of two boars, Berkshire and Essex, to Judge Blain, of Manhattan.

Haying has been commenced on the farm. A very good crop of clover and an extra growth of alfalfa were being cut on Thursday.

We acknowledge the receipt of a cordial invitation to be present at the Commencement exercises of the University of Kansas, to be held from June 6th to 11th.

The College farm has made a very decent thing by holding to last year's wheat crop. Last fall sixty cents was the price. The crop has just been sold for ninety cents.

Mark Reeve, one of our Lyon county students, has presented the Department of Industrial Drawing with a neatly executed model of a truss roof, a specimen of his own handiwork.

A lady friend who visited our office during Commencement said that she had preserved the INDUSTRIALISTS that came to her house, and now had a complete file. We are glad to know that the paper is thus appreciated.

One of our students told us the other day that during the last term he had more than made his expenses. He entered College last January, and when the term closed he had $5 more money than he brought here. Of course, every student cannot do this well; but a young man who is industrious, handy and reliable will find no trouble in making one-half his expenses.

District boards about to issue school bonds are invited to correspond with us before negotiating elsewhere. We are paying par for first-class 7-10 bonds, issued upon our blanks. Bonds drawn on our blanks are not transferable, and hence may be safely sent by mail at letter postage. Blanks furnished free of charge on application to M. L. Ward, Loan Commissioner.

We have on hand some bound volumes of the INDUSTRIALIST, which we will sell at the following figures: Vol. II., from April 15, 1876, to April 14, 1877, $1.00; first half of Vol. III., from April 14, 1877, to Oct. 6, 1877, fifty cents; second half of Vol. III., and Vol. IV., from Oct. 6, 1877, to April 12, 1879, $1.50. These figures do not include postage. Persons desiring to purchase any of the above, should order immediately, as we have but few copies. Old students will find these bound volumes especially interesting and valuable. Address A. A. Stewart, Manhattan.

The annual meeting of the State Teachers' Association will be held this year in the University building, at Lawrence, beginning on the 16th of June. During the same week, and in connection with the State Association, there will be held a County Superintendents' Convention, a State Normal Institute, and a State Examination. Since all of these meetings are of special interest to every live teacher, and because such liberal reductions have been made by railroads and hotels, it is believed that this educational gathering will be largely attended and very interesting and profitable.

The report of the last meeting of the Alpha Beta Society for the spring term of 1879 has been crowded out of our last two issues, and is now inserted for the benefit of old students who are watching the progress of the Society. At the last meeting the hall was well filled. Among the many visitors present, we noticed some of the Webster boys, 'willing to bury the hatchet.' The *Gleaner* was presented by George Rose and Miss Hattie Mills. The paper reflected credit on the members for their original and liberal contributions.

Those present were greatly interested in Prof. Failyer's recount of the progress of the Society during the past five years. It seems that the Society closes this term with as much, if not more, interest than it has had at the close of any previous term for several years.

The Seniors made their farewell addresses to the Society, which closed the present term's career with flying colors. Next term many of our active workers will be back; and we trust the Society will move gloriously on in its work. A parting song was rendered by the music committee, and the Society adjourned. GEO.

The last session of the Webster Society was held on Saturday evening, the 20th inst. According to the decision of the judges, it is without doubt the object of the Democratic party to commit some act that will place the Government in the hands of southern rebels. There being no Democrats in the Society, it was a hard matter for the debaters on the negative to defend the action of the revolutionists in Congress. The *Reporter* was presented by A. Beacham; and, though lengthy, it was replete with wit and wisdom.

The Society was compelled at this session to bid good-bye to four of its most active members, Messrs. Salter, Eckman, Wood and Rushmore. These persons leave with the best wishes of the Society, and with the hope that they may be successful in the great battle of life. They have been earnest, hard-working members; and no doubt are fully convinced that there is a world of truth in the motto, "Labor Omnia Vincit."

Though I may be accused of digression, I should like to say a few words about the College and College life. More earnest work I have never seen done by any class of students. Every one seemed impressed with the idea that each moment must be improved. Not one quarrel have I known during the College year. Hard, earnest, honest work has characterized the school from September to May. I never fully realized the many shifting scenes of life until I came here. Students coming and going. You greet new ones to-day and bid farewell to old ones to-morrow. Some are called away by the want of funds and others by the death of friends or relatives. Some come full of hope and expectation, and are stricken down by the ruthless hand of death. Nearly all come fired with ambitious projects for the future. Some of these are realized, while others meet with disappointment and defeat. We part at the end of the year hoping to meet each other at the beginning of the next term. Some of us will do so, while others part to meet each other only occasionally during the voyage of life, and some never again on this of the great river of death. Such is life. L.

NATIONALIST ITEMS.

Marion Glascow caught a cat-fish last Monday night that weighed about seventy-six pounds.

Everybody remarks the amount of building that is going on in Manhattan at the present time.

Good progress is being made in raising the subscription for building the new Methodist Church. Thus far over $3,000 has been subscribed.

Mr. Elmer Headings, who came to this place not long since, from Pennsylvania, was drowned in the Blue River, near Stockdale, on Tuesday evening, while bathing.

The divide between Wild Cat and Mill Creek is rapidly filling up with new settlers. Indeed, all around, wherever a few acres can be found that can be plowed, they are being taken up.

The mammoth residence of the city is situated in the west end of town. It is 6x6 and six feet tall. The stove is set up on the outside, in order, we suppose, to let the resident get himself all in at once.

Prof. Platt and wife, with an "ark" load of young singers, among whom were Misses Ettie Campbell and Ella Vincent, also John Mann and Will Eckman, started on Tuesday for Council Grove, to attend a musical convention at that place.

Last Sunday night some scoundrel attempted to burn the Christian Church. Part of a board had been taken off, and oiled rags inserted and lighted. Between eleven and twelve o'clock Mrs. John Elliot heard the flames and aroused her husband and family, and between them the fire was extinguished. * * * The name of the wretch who set the fire is not known.

The temperance organizations of the city have decided to hold a basket picnic in Brous' grove across the Blue, on Friday, June 6th. They cordially invite the members of all temperance organizations within convenient distance to be present. They expect to have an interesting programme of music, speaking, etc., besides the usual games, swings, boat rides, and the like.

AS OTHERS SEE US.

Prof. H. C. Rushmore, son of G. H., having recently graduated at Manhattan, returned home Friday, wearing his honors manly but with proper dignity.—*Oskaloosa Independent.*

Dr. W. L. Challiss returned from attendance of the Commencement exercises at the State Agricultural College, at Manhattan, yesterday. He reports the exercises as interesting, and creditable to the students.—*Atchison Champion.*

The recent Commencement exercises at the Agricultural College are highly spoken of, by many who were present, as demonstrating a gratifying degree of progress in that Institution. The Regents are using their best efforts to make the College an honor to the State.—*Abilene Gazette.*

All of the graduates acquitted themselves with credit, and showed the excellent character of the instruction they had received in the matter and manner of delivery. The course of instruction in this Institution is practical rather than ornamental, and is intended to fit its graduates for the duties of practical life.

Mr. Henry returned from Manhattan Thursday morning, having been in attendance at the Commencement exercises of the Agricultural College. He was very much pleased with the exercises, is becoming enthusiastic concerning the College, and reports the prospects for the future very flattering.—*Abilene Chronicle.*

They [the Regents] are all good men. The majority of them are largely identified with the agricultural interests of the State. They are clearly the right men in the right place.

The people of Manhattan showed marked courtesy and respect to all visitors. No pains were spared to make their stay pleasant. All went away impressed with the feeling that Manhattan is one of the very best towns in the State, and that the Agricultural College is one of the very best of her institutions.—*W., in Washington Republican.*

Our mind being thus biased by these unfriendly criticisms, it was much unfitted for the reception of facts, as they presented themselves during our tour of inspection. Suffice it to say that we were agreeably disappointed. All impressions inimical to the success of the Institution have been removed; and our present wish is that all who are prejudiced by the false representations of others, may be induced to visit Manhattan and judge for themselves. In our humble opinion, the Agricultural College is on the highway to prosperity.—*Correspondence Abilene Chronicle.*

DIRECTIONS TO APPLICANTS.

TERMS OF ADMISSION.

Candidates for admission must be fourteen years of age, and pass a satisfactory examination in reading; arithmetic, through decimal fractions; and English grammar, to syntax. Classes are started at the beginning of each year in Drill in Arithmetic and Drill in English; and the pupil must have the knowledge above indicated, else he will be unable to retain position if admitted.

Pupils will be received at any time during the year, if able to pass an additional examination upon the subjects studied by the classes which they expect to enter. But they will find it greatly to their advantage to be present at the opening of each term, or as soon thereafter as possible.

GRADES.

Both the Literary and Industrial recitations are graded daily upon a scale of 100; and an examination of all classes is made at the close of each month. A student not attaining an average grade of sixty is promptly dropped to a lower class, or excluded from the Institution until able to do so. The work of grading is strict and uniform in all the departments, and this process is rigorously used for sifting out incompetent and indolent pupils; thus more than accomplishing all that is designed to be effected by a "high standard of admission." Hence, the student's continuance in the College wholly depends upon his own action.

The course is based upon the determination to make the labor required in the preparation of one industrial and three literary recitations as much as the average student can perfectly perform, in ten hours a day. We design to give the pupil the worth of the time expended at College; and, in order thereto, he must do a full day's work with brain or hand. Only those students who can maintain a standing of ninety in each study will be allowed to take more than the prescribed number of recitations; and no one will be permitted to have less than one industrial and three literary recitations.

RELIGIOUS.

Unless otherwise directed by parents, students are required to attend chapel at 8:30 A. M. on academic days, and divine service once every Sabbath.

EXPENSES.

There are no charges whatever for enrollment, attendance or instruction in the regular courses; nor are there any "contingent fees" for the repair of buildings, for the use of books or apparatus, for diplomas, or the kindred privileges usually grouped under the term "contingent." Male students are furnished instruction, the use of apparatus, instruments or tools, in both the literary and industrial classes marked out for them, without any charge. And the same is true of female students in the regular classes provided for them. Printing and Telegraphy are industrials primarily provided for the education of female students, and male students taking either of these are charged $1 per month for use of instruments.

Instrumental music is a fine art or "accomplishment," rather than a mechanical art. We do not place it among our "industrials" in the same sense, or for the same purpose, that we do those provided for teaching the trades. Accordingly, a fee of $12 per term, or seventy-five cents per week is required from female students for tuition and the use of pianos or organs.

The only charge made for material in either the literary or industrial departments is for the chemicals used by students in laboratory practice, which are furnished at wholesale prices, and amount to but a small sum.

Furnishing an absolutely free education is as much as can be reasonably asked; and the Institution neither boards, clothes, nor supplies the student with text-books. Boarding can be obtained in private families at from $2.75 to $4 per week. Washing costs from seventy-five cents to one dollar per dozen. Text-books, which can be procured in Manhattan, cost from $2 to $5 per term.

No student need expend over $5 per week; and many of our best pupils are living at $1.25 per week. Students desiring to "board themselves" can do so at from $1 to $2 per week. In a club of four young men, renting a house, the average cost to each for the term was $1.11 per week.

LABOR.

Manual labor by the students may be for either of two purposes: First, to acquire skill in a given art; second, to earn money. In the first case, the labor is educational; in the second, it should be paid for by the party benefited.

Educational Labor.—Manual labor in the recitations of the Industrial Departments, like mental labor in those of the Literary Departments, is purely educational and will not be remunerated. While the interest of the student will be held paramount in the direction of this labor, the practice necessary to dexterity will be required.

Remunerated Labor.—When the Institution needs labor on the Farm or elsewhere which is not educational, but simply for its own profit, and which a student is able and willing to perform, it becomes an employer instead of a teacher, and he an employe instead of a scholar. It pays for work, he works for pay. The relation between them is commercial, not educational; and both parties must act upon business principles. Hence, the College furnishes only such employment as its own interests require, and will pay according to the value of the service rendered at from seven to ten cents an hour.

AMOUNT EARNED.

It is impossible to predict how much a given person can earn, since that depends upon what he can do and what work there is to be done. Hence, it is wholly impossible for us to answer the question so often asked: "Do you think I can meet my expenses by work?" Some students make one-half their expenses, some the whole, and exceptional men have made more than expenses. As a rule, a faithful boy skilled in farm work can earn half his expenses on the Farm or in the Nursery. During the year he can ordinarily acquire sufficient skill in the wood or iron shops to enable him to make articles for sale. The whole question is one for his own consideration and decision. We can teach all who come, but cannot absolutely *promise* anything more. Hitherto we have refrained from holding out strong inducements respecting the amount of labor we might have to offer; but in view of the fact that during each of the last three years we have had more to do than the students could perform, we are inclined to give greater and positive encouragement on this point. Any boy who is in dead earnest, who is familiar with farm operations, and who can raise $50 to start with, should be able to carry himself through the four years' course. And certainly this places an education within the reach of every determined boy. As yet we are unable to offer similar advantages to girls, not requiring labor in the College departments which they can perform.

RULES.

1. Behave as a true man or woman should, at all times and in all places.

2. Attend to your own business promptly, thoroughly and courteously; and vigorously let alone that of other people.

3. Penalty: "Leave!"

PUBLICATIONS.

The "Hand-Book," published in 1874, containing a full discussion of the educational question and the aims of the Institution, will be forwarded to any one desiring it.

THE INDUSTRIALIST, a weekly journal edited by the Faculty and published by the Printing Department, contains original and seasonable articles on the Farm, Orchard, Trades, Sciences, and Education. Price, 75 cents a year. Address A. A. Stewart, Manhattan.

CALENDAR.

Winter Term 1879.—Began Friday, January 3d, 1879.

TO NEW STUDENTS.

Bring the text-books you have been using. On arrival, first arrange for your boarding. A. A. Stewart, Sup't Printing Department, will furnish information, either by letter or on application, concerning boarding places or rooms for rent. Report to the President at 8:30 A. M., immediately after chapel, for enrollment.

For further information apply to Jno. A. Anderson, President, Manhattan, Kansas.

LITERARY SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in College building every Friday at 2 P. M. Ladies admitted. New students cordially invited to attend. GEORGE PERRY, President.
MISS GRACE PARKER, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Telegraph Hall every Saturday evening. Visitors, especially students, always welcome.
C. E. WOOD, President.
C. M. SHARTEL, Secretary.

RAILROAD TIME-TABLE.

KANSAS PACIFIC RAILWAY.

PASSENGER ARRIVES.

No. 2, going East	11:14 A. M.
No. 4, going East	3:47 A. M.
No. 1, going West	5:10 P. M.
No. 3, going West	4:33 A. M.
No. 7 (freight), going West	8:15 A. M.

Nos. 1 and 2 run daily; Nos. 3 and 7 run daily except Monday; No. 4 runs daily except Sunday. Passengers with tickets are carried on No. 7.
GEO. C. WILDER, Agent.

THE INDUSTRIALIST.

SATURDAY, MAY 31, 1879.

Industrial Education.

The real value of an education to the student depends upon two things: First, the practical worth of the knowledge taught; and, second, the degree in which he makes it his own. Hence, the ability of any institution to give a practical education depends upon the kind and aim of the knowledge it teaches, and upon the thoroughness of the instruction therein. The State Agricultural College was directly endowed by Congress, and is guided by the State, for the specific purpose of furnishing to the industrial classes of Kansas a "practical" education, that is, "one fit for use." As its name indicates, and as the statistics of the industries of the State require, its chief work must be that of giving a useful and usable education to those who will engage in farming; and, therefore, the Farmer's Course must, from the nature of the case, be its main one.

FARMER'S EDUCATION.

Words and figures are merely instruments with which to record ideas. They are not themselves ideas, nor should they be made the chief end of an education. As a wagon is necessary to haul grain, so are they a necessary part of an education; but as the wagon is not the grain, so they are not the knowledge which the farmer converts into money. Hence, the classics and higher mathematics are not taught. But it will be noticed in the following course that so soon as the pupil acquires working skill in the use of the English language as a tool, and of figures and lines as mathematical tools, those arts and sciences which present knowledge that has a cash value to the farmer are taught as rapidly as their importance and thorough acquisition will permit. Studies numbered (1) and (4) in the second, third and fourth years are the spine of the course, to which the others are as ribs and muscle.

FARMER'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Practical Agriculture (advanced.)		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	
3. Polit. Economy, Practical Law.		3. Practical Geometry.		3. Algebra.		3. Industrial Drawing.	
4. Zoology.		4. Horticul., Landscape Gardening.		4. Practical Agricul. (elementary).		4. English Structure.	
5. Agricul. Chemistry	Meteorology.	5. Organic, Analytical Chemistry.		5. Physics.		5. Adv'd Arithmetic, Book-keeping.	
6. Logic.		6. Practical Surveying.		6. Industrial Drawing.		6. U. S. History, Industrial Drawing.	

WOMAN'S EDUCATION.

Nearly one-half of our students are females, and the Woman's Course is prepared expressly for their liberal and practical education. We have no doubt whatever that practical men and women, who understand what it means and what it seeks to do, will fully endorse it.

WOMAN'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Farm Economy, Special Hygiene.		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	
3. Polit'l Economy, Practical Law.		3. Industrial Drawing.		3. Algebra.		3. Industrial Drawing.	
4. Zoology.		4. Horticul., Landscape Gardening.		4. English Literature.		4. English Structure.	
5. Phys'c'l Geography, Meteorology.		5. Organic, Household Chemistry.		5. Physics.		5. Adv'd Arith., Book-keeping.	
6. Logic.		6. Household Economy.		6. Industrial Drawing.		6. U. S. History, Industrial Drawing.	

MECHANIC'S EDUCATION.

Because of the adaptedness of the leading course to the wants of the intelligent mechanic, it has been found practically unnecessary to diverge from the Farmer's Course. Additional studies, specially adapted to the mechanic's use, will be furnished in a Post-Graduate's Course.

If it be urged that the distinctively agricultural knowledge taught in the Farmer's Course is not directly valuable to the mechanic, we reply that, admitting the point for the purpose of argument, yet: 1. This knowledge is of more practical value to the mechanic than is the Latin, Greek, or a half dozen other things embraced in the usual course preparatory to the professions; 2. That the great majority of Kansas mechanics will also be more or less engaged in agriculture; 3. That those studies in the course which are directly valuable to the mechanic, together with the shop facilities, offer a better mechanic's education than can be elsewhere found west of the Alleghanies.

INDUSTRIAL DEPARTMENTS.

Having knowledge in the head is one thing; ability to use it with the tongue, fingers or feet is quite another thing. Both are vital to success in practical life. A man might thoroughly understand the theoretical principles of carpentry, and yet, not having used the tools, be wholly unable to earn carpenter's wages. So in all other vocations. Accordingly, instruction is given in the following well-equipped Industrial Departments, and every student is required to recite in some one of them, as selected by the pupil or parent:

FOR MALE STUDENTS.	FOR FEMALE STUDENTS.
The Farm.	Dress-making.
The Nursery.	Printing.
Carpentry.	Telegraphy.
Cabinet-making.	Scroll-sawing.
Turning.	Carving.
Wagon-making.	Engraving.
Painting.	Photography.
Blacksmithing.	Instrumental Music.

Each of these departments is conducted exactly as in daily life, and aims to give precisely the drill received by an apprentice. No charge is made, either for tuition or material, from male students taking the Industrials provided for them; nor from female students taking the ones provided for them, except in Instrumental Music. Male students taking either Printing or Telegraphy are charged $1.00 per month for the use of instruments and material.

DEPARTMENTS OF INSTRUCTION.

DEPARTMENT OF AGRICULTURE.

PRACTICAL AGRICULTURE.

Second Year:—General principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage.

Fourth Year: General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of a rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farm-houses; barns.

FARM ECONOMY.

Woman's Course, Fourth Year: Dairy products as human food; influences affecting character of milk; manufacture of condensed milk; the factory system and household plan of cheese-making; treatment of rennet; general process of cheese manufacture; subsequent treatment of cheese; butter-making; creameries; "deep" and "shallow" setting systems; general process of butter-making; packing and preserving butter.

DEPARTMENT OF BOTANY AND PRACTICAL HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest; also a course of lectures on Landscape Gardening. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard; fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture; shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in in the work of laying out and plotting grounds topographically.

CHEMICAL DEPARTMENT.

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life. Text-book, Ganot.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blow-pipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

Are constantly in progress in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

DRILL IN ENGLISH.

"As grammar was made after language, so ought it to be taught after language."—*Herbert Spencer.*

Drill in English embraces the following topics:

Sounds of the language; drill in producing the vocal, sub-vocal and aspirate elements with accuracy, distinctness and volume; vowels, consonants.

Letters: Form; power; rules for spelling, drill.

Words: Signification, properties, modifications, variations, relation and dependence.

Sentences: Drill in statement of ideas; description, clearness, terseness, vigor; business letters, discussion; capitalization; syllabication; punctuation; construction and analysis of sentences; elements, uses and names; criticism of compositions printed as written; proof reading; grammatical construction; superfluous words and clauses; drill in reading, speaking and penmanship.

Text-books: Webster's Academic Dictionary; Lee & Hadley's Advanced Lessons in Language.

Pupils deficient in spelling, etc., should enter the printing class, the printing-office being the work-shop of language.

STRUCTURE OF ENGLISH.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

MATHEMATICAL DEPARTMENT.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

DRILL IN ARITHMETIC.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands a ready application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Following this line, the student, so far from hammering away at "pure" science draws from the mathematical store-house what he needs, and sees why he needs it. Accuracy of calculation and posting, rather than a *mere* comprehension of the principles, is aimed at. Besides the recitation-room drill in business forms, practice in the field is also given. Estimating the number of cords in a pile of wood said to be 100x4x4 feet is one thing; measuring a pile of wood through which any number of cats may be harmlessly thrown, and in which four-feet sticks are the exception, is quite another and more difficult thing.

ARITHMETIC AND BOOK-KEEPING

Is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides ensuring arithmetical practice, develops practical skill in that important art.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admiral system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study. In addition, constant practice in the application of lines to metal and wood is furnished in the Blacksmith, Carpenter, Turning, Scroll-sawing, Carving, Engraving and Printing shops, and to fabrics in the Sewing Department.

PRACTICAL GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the use of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

PRACTICAL SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

STUDIES SPECIAL TO WOMAN.

Besides the studies already indicated, attention is called to the following:

SPECIAL HYGIENE.

As shown in the course, one term is devoted to the study of Physiology, from the text-book of Dr. J. C. Dalton. This is followed in the fourth year by a course of lectures to young ladies by Mrs. Cripps on the subject of Hygiene, embracing such instruction in hygienic matters as are valuable to woman.

FARM ECONOMY considers those affairs of the farm which usually come under the supervision of the farmer's wife or daughter, and which are not included in "gardening" or "household economy;" such as butter and cheese-making, dairy management, etc. A course of lectures is delivered by the Professor of Practical Agriculture. See heading, "Farm Economy."

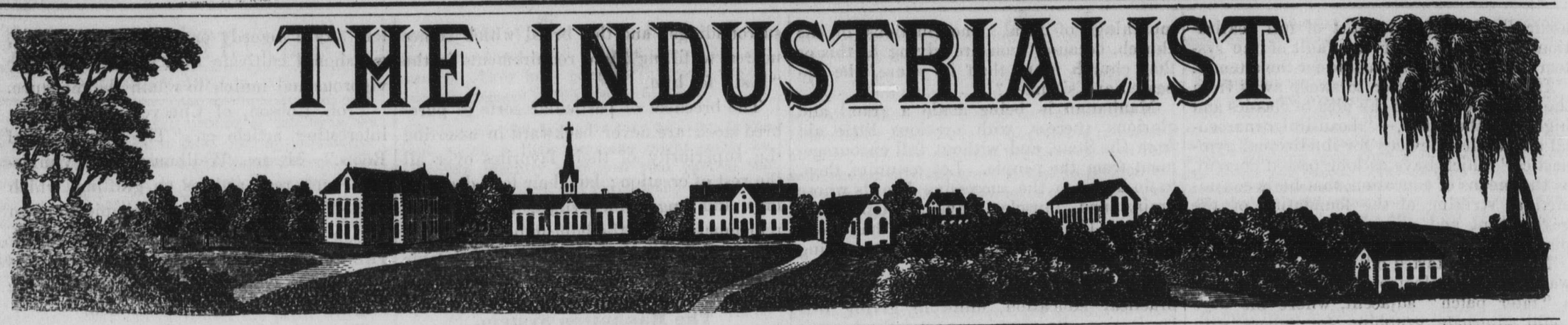
GARDENING is included in Practical Horticulture. See heading, "Landscape Gardening."

HOUSEHOLD CHEMISTRY. See heading, "Household Chemistry."

HOUSEHOLD ECONOMY

Follows Household Chemistry and consists of lectures by Mrs. Cripps on the art of house-keeping, embracing cookery, domestic management, and kindred topics. Many elderly gentlemen sufficiently know, and more young gentlemen will duly discover, that systematic knowledge of how cooking ought to be done is luminously different from the ability to do it. Instruction without practice can effect but little. Accordingly, a kitchen laboratory has been completely furnished, and affords every facility for drill in the art of cooking. This drill chiefly differs from that of a kitchen in the respect that after a girl has learned to wash dishes or pare potatoes she is not kept everlastingly at either. After full trial, we have found it just as feasible to give this practice, with profit and pleasure to the pupil, as it is to give laboratory practice in chemistry,—and no more expensive.

Printing!—Daily instruction and drill in the work of a First-Class Printer. The Literary Departments offer a thorough education in the construction and use of the English Language, as employed by the Proof-Reader; in Book-Keeping; and in Industrial Drawing, as the best developer of that taste necessarily exercised by every good Job Printer. The Printing Department is well furnished with all the facilities for a speedy mastery of the art of Printing, and is in charge of a practical printer. Besides regular class instruction in printing, the weekly publication of the INDUSTRIALIST by the Department furnishes advanced students the requisite drill in newspaper work.



THE INDUSTRIALIST

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Address A. A. STEWART, Manhattan, Kas.

Schools for Special Trades in Europe.

These schools are very numerous in all European countries. There are over fifty of them in Belgium, more than a hundred in Switzerland, nearly fifteen hundred in Germany, and probably one thousand each in Austria and France. Their object is to prepare skilled workmen for particular trades. The branches of instruction pursued in the elementary schools are sometimes taught in them; but, in a general way, a certain amount of knowledge is required for admission, and then they confine themselves strictly to that course of theoretical and practical instruction deemed best for the special object in view.

Among these schools are some supported wholly by the State, others by municipalities, and still others by incorporations or individuals. Belonging to this class may be mentioned the schools of agriculture, horticulture, forestry, mines, commerce, navigation, building, etc.; also, the still more special schools for teaching weaving, watch-making, wood-carving, stone-cutting, lace-making, sewing, printing, dyeing, jewel-cutting, straw-plaiting, and work in bronze, ivory, glass, clay, etc. This kind of instruction appears very novel to an American, but the whole system is deeply interesting. Many of these schools were represented at the Paris Exposition, and attracted much attention.

The practical instruction, certainly the most important for the class of pupils admitted to these institutions, who when they leave school must be fit for practical life, is given in special workshops by clever masters, where the boys are taught for carpenters, smiths, braziers, painters, masons, stone-cutters, cabinet-makers, wood-carvers, modelers, turners, etc. All petty work is entirely excluded: the boys are as much as possible occupied with work of solidity and utility, either for use in the school, or for sale to the trade. This instruction is given in such a way that without exaggeration it may be said that the pupil, from the moment of entering the school,—or, in this instance, the workshop,—enters into real life. In the first place, he is made familiar with the tools, and immediately afterwards intrusted with work which when finished has a real destination, so that his task is never useless in his own eyes. The ambition and the desire to do right are kept more alive in this way than by working without a well-defined aim. Moreover, experience has taught that a promise to be allowed to work at a large and *bona fide* piece of workmanship excites ambition in boys.

The workshops are all as far as possible up to the standard of the present day, and provided with all necessary tools and conveniences of the most approved kind and quality. The boys are not allowed even to handle imperfect or worn-out tools. In the carpenter's shop, where more than eighty pupils are taught together, there are a sufficient number of benches, with all requisites thereto belonging; and in the smithies, with seventy boys, are all needed forges, anvils, vises, benches, etc.

Besides the continual enlargements and improvements of the several workshops, required by the increasing number of pupils, constructed by the boys themselves under the eye of the masters, the carpenters make chests for the school, benches, trestles, ladders and steps, windows, doors, desks, etc. The smiths make big nails, cramps, books, hinges, locks, stoves with appurtenances, screw-nuts, smiths' tongs, girders, etc. The braziers make different kitchen utensils, as water-cans, soap-tins, baking-pans, kettles, dust-pans, springs, stair-rods, and eyes, basins, etc. The braziers are also taught stretching, turning, forging and soldering. The instrument-makers, working in the smithies, are instructed in the cutting of screws and worms, the forging of steel and copper, and the casting of copper objects. The masons make different joints, plain walls, foundations, chimneys, niches, sewers, arches, etc. The stone-cutters make sink-stones, steps, stone thresholds, key-stones; and besides this they are taught the hewing of slabs, transposing stones, placing finished pieces of masonry, flooring tiles, and placing plinths. The painters are instructed how to make putty, to grind paint, to stop, to smooth, to rub, to cut and set window glass, to write and paint letters, and to imitate wood and marble. In the work-shops for cabinet-makers, wood-carvers, and turners, they make benches, lime and screw tongs, and other tools, drawers, and modeled and carved ornaments.—*Barnes' Educational Monthly.*

Our Exchanges.

Blue-grass does not seem to stand shade, and in this country grows short. Alfalfa clover grows right strong anywhere, and makes the best known feed for stock and hogs. One acre of good alfalfa is worth $50 a year to any man.—*Farmer's Advocate.*

Farmers should keep a supply of paper and pencils, so as to jot down their thoughts for the agricultural papers. All should be teachers as well as learners. They should give their experience—their successes and failures. If they see errors in the writings of others, they should say so. Keep the truth uppermost and error under foot.—*Coleman's Rural World.*

An Iowa exchange says: "That each young lady graduate of the Iowa Agricultural College, has either married or had an offer of marrage within *six* months after graduation; and most of them married young men owners of farms." Young Kansas farmers should visit *our* Agricultural College and get acquainted with the lady students.—*Kansas Agriculturist.*

A fine horse belonging to Mr. H. W. Tusten ran into a barbed-wire fence last Sunday, and was horribly butchered up. Barbed-wire fences may be a good thing, but a decent amount of compassion for the brute creation certainly demands a law prohibiting their use, except in connection with boards, or some other device for making the fence visible.—*Russell Record.*

A man named Guthrie,—a contractor on the tenth mile of the C., S. & Ft. Smith Railroad, near El Paso,—and his team, were killed by a stroke of lightning during the storm on Monday last. He was returning from the grade with his wife and daughter, when the storm overtook them. The daughter was in the seat with her father and the wife was behind, neither of which was hurt.—*Cowley County Telegram.*

One day last week Mr. F. P. Gale, living two miles east of Marena, found an old Indian grave. In it was found an Indian in a sitting position; and with him was found one saddle, two looking-glasses, one scalping-knife, a buffalo robe, half a dozen steel watch chains, three or four steel bracelets, blankets, one white door-knob, a pair of buckskin breeches trimmed richly with beads and buttons, some sleigh bells, a rich head-dress, two silver spoons, a fine spear, a pocket-book, and a few belts richly trimmed with silver. Everything was in a state of decay.—*Hodgeman Agitator.*

The storm that passed over us on last Tuesday night, and which was followed on Thursday by the drenching rain, did us much damage, not the least of which was the utter demolition of our subscription book, which had been neglected and left lying on a table directly under that portion of the roof of the office that had been so promiscuously perforated by the big hail; so that it was impossible to write our mail list correctly. We have written up a new book, from the fragments of the old and our recollection; and should any be missed, we will take it as a great favor if they will let us know it, so that we can supply them with the paper, and get their names on our new book.—*Beloit Courier.*

State Agricultural College.

We quote from the Atchison *Champion* the following appreciative article on the College and its work. Prof. Johnson, the writer, came here as he says with the belief that industrial education was a "barren ideality;" and after spending a number of days in critical examination of the work of the College, he confesses to a "change of heart." We regret exceedingly our inability to give the article in full:

HIAWATHA, Kas., June 9th, 1879.

To the Editor of the Champion:

Returning recently from a visit to an Institution that should be "a pride of the State," I feel that I can perform no greater service to your readers than to give them an account of the Agricultural College at Manhattan.

I confess that I went to Manhattan prejudiced against the Agricultural College of Kansas, and entertaining the belief that industrial education was a "barren ideality,"—a beautiful Utopian dream, but not susceptible of realization. From what I had understood, I fully believed that our College was the most conspicuous failure in a system that was itself a failure. Since visiting Manhattan my views have been wholly changed; and now I feel wonder and regret that the youth of northern Kansas, especially, have failed to avail themselves of this bountiful provision for their welfare.

Let us take the case of five young men who can command a little money, say from thirty to fifty dollars a year. One of them wishes to become a printer, and wishes also a thorough English education; another wishes to become a scientific farmer, capable of taking advantage of every factor of success in that noble art; another wishes to be a gardener, nurseryman, or fruit-grower, or all of these; another wishes to learn carpentry and joining; another wishes to learn pharmacy and chemical technology. By going to the Agricultural College they can learn these trades; and at the same time they can receive a good English, scientific and practical education, which shall embrace the elements of all the practical sciances. And this at a cost so trifling that elmost any live boy in the land can obtain it. These boys, entering at Manhattan, have nothing to pay for tuition. If resolute they can board themselves at a cost of one dollar a week; if still more resolute, they can earn twice this amount, or more even than that, at extra work on the farm, for which they can receive ten cents per hour. The course is so arranged that every pupil can have four hours to devote to physical development and pecuniary earnings each day. Who shall say that it is not better that a boy do this than "develop his muscle" in boat-rowing or base-ball?

The course at Manhattan embraces nearly all that is utilitarian in education. Chemistry, botany, geology, physiology, zoology, meteorology, and mineralogy, all receive their just share of attention. These sciences lie at the base of all knowledge and all progress. By understanding them, a Science of Life becomes possible. With the development of biology, the science of social life and organization also advances. The Manhattan system of education is an attempt to reduce this conception to a reality. Most

assuredly it falls far short of full realization, but it is neither the fault of the system nor of those responsible for the attempt.

It is no small matter to sweep away from the idea of education the idea of classics and higher mathematics,—"beautiful, ornamental and useless devices for intellectual gymnastics," which have so long passed current, as the means of education, that he is considered as striking at the foundation of the government and church who seeks to displace them by utilitarianism.

Manhattan started off on the idea that it was to be a theologico-classical school, with a "tater patch" adjacent, where the boys could alternate grubbing for tubers with grubbing for roots of the Greek verbs. All this, in 1873, by a resolution of the new Board of Regents, was upset, and the attempt made to educate the youth of the land in the useful sciences, and practical drills in their application to the more common arts and industries. The "revolution" kindled much opposition, and the advocates of the theologico-classical system of dwarfing the intellect by Greek and Latin compresses, made Rome and all its precincts howl with their scoffs and denunciations.

Manhattan has not, therefore, received its just support from the State Legislature, the State officials, the county superintendents, the State press, and hence not from the people. Here is a magnificent endowment, bestowed by the general government for the benefit of industrial education, with special reference to the needs of our principal industry — agriculture. That fund cannot be applied to the erection or maintaining of buildings or libraries. But its usefulness may be and has been greatly "cribbed, cabined and confined" by a systematic course of pinching it back by the State. Surely it is poor economy for the State to cripple the utility of this Institution by cutting off requisite appropriations for buildings, and all needful adjuncts for bringing forth the best results. People of my acquaintance have scoffed at the College because it has not brought forth greater results. These people are of the kind that feed their milch cows on cottonwood fencing, and then kick them because they do not give a bountiful supply of rich milk.

The State Agricultural College has given returns for vastly more than might rationally be expected from the nubbins doled out to it in the way of appropriations.

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Everywhere, about the College and its grounds, there is the trace of the master's hand. Some genius, you feel, has struck the old dogmas of education a blow that shall ring throughout all time. A Napoleon has here upset something which corresponds to the doctrine of the "Divine Right of Kings." He has gone. Collegiately speaking, he is dead; but his spirit seems to linger about the place, and we seem to come upon him at every turn. The history of the Manhattan idea begins with the accession of the late John Anderson — now unhappily departed this life to the land of the ambitious politician. The departed had a large personal equation, not wholly free from eccentric faults. I feel that he has committed some blunders in lopping off superfluous branches from the educational tree,— sacrificing something capable of glorious fruit. I feel, also, that he has made a mistake in overpruning,— that the course for the degree of B. S. should have extended through one more year. I feel, also, that in his zeal to exalt and uphold and build upon solid rock "industrial education," he has been led into undue disparagement of the æsthetical part of life's pleasures and duties. Yet, notwithstanding these faults, I feel confident that he has come nearer attaining a realization of the ideas actuating those who obtained the grant than has been elsewhere attained.

A word should also be spoken, in this review, of those gentlemen who consent to serve the State as Regents. Few persons, not present at their sessions, can fairly estimate the labor, the care, the forbearance, and sound judgment required to run such an Institution. Oh, the things that they need if their funds were ample. Here, too, is this department pushing its horn a little in advance of some other, and is demanding funds. How shall all receive their just proportions? What shall be done to promote generous emulation without provoking acrimonious rivalry? How shall a feud that is bursting into war between Faculty factions be composed, and all brought into harmonious working? How shall the mouthings of rival denominations of the church, because "you are giving to this or that church more than its share," be appeased and silenced?

Manhattan is being made a grand and glorious success, with precious little aid from the State, and without full encouragement from the people. Let us unite, then, to do honor to the successive Boards whose brains and muscles have wrought this result. The "northern tier" has been poorly represented by her sons, in getting the benefits of this Institution. Let press and pulpit, and the voices of all friends of practical education, unite in giving this Institution its just support. Send your young men and maidens to it, if you would have them really furnished with the implements, the thoughts, the discoveries, the triumphs of industrial life, in entering upon life's grandest work — the subjugation of matter and material forces to the support, comfort and convenience of the aggregate man — humanity. The effect is civilization — the achievement enlightenment. What can Kansas need more than the instruction of her coming generations in the underlying principles and fundamental practice of the industrial arts? What can add more to her wealth than to give her sons and daughters, to each after his liking, an education in some special industry, while to all is given the outlines of the whole philosophy of matter and force, and of the laws of life and of social life. C. W. J.

THE INDUSTRIALIST.

SATURDAY, JUNE 28, 1879.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

As the time for beginning the Fall Term of 1879 has been slightly changed from previous dates, the press will confer a favor upon the College by publishing the following announcement:

The Fall Term of the Agricultural College begins Wednesday, September 10th, 1879, and closes December 18th, 1879.

THE Sumner County *Press* has ordered a $2,000 power press.—*Exchange.*

Just as we expected. Capt. Folks, it will be remembered, was at one time "business manager" of the INDUSTRIALIST. Undoubtedly the business habits there acquired, and the constant contemplation of a first-class journal like the INDUSTRIALIST, gave the editor of the *Press* his first distinct notions of "getting on in the world." Anyhow, Captain, "here's hopin'" you and the *Press* may have more of the same kind of luck.

THE Short-horn is essentially a beef-producing animal. If the West was as much of a dairy as a beef-raising country, Short-horns would be in very little demand. It is no argument in favor of a cow that she gives a large quantity of milk, if it is poor in quality. The Short-horn, as a dairy animal, can well afford to leave the field clear to other breeds, and stand on its record as a beef-producer. There is no conflict between the Short-horns and the Polled cattle as to dairying qualities. The question is purely one of *beef.*—*Kansas Farmer.*

The above is a solid nugget of wisdom which we commend most heartily to our readers. The notion so generally prevalent that there is some one breed — the "best breed," in common parlance,— superior to all others, and that some one breed may be made to answer all the uses for which cattle are kept, is utterly fallacious. The only animal that fulfills all these conditions is the "native" and mongrel; and "improved" breeds are chiefly valuable because they excel in some one particular, and transmit this with certainty. The writer of the above paragraph would have been equally in the right if he had said the Short-horns were not the rivals of Polled cattle or any other breeds. It is the business of the farmer to know which breed is best adapted to his wants, his means and surroundings; and that breed which comes nearest to filling these requirements is the "best" for him.

The breeders of particular sorts of pure-bred stock are never backward in asserting the superiority of their favorites over all the rest of creation; but their loud declaimings and angry bickerings, it should be remembered, like the buncombe speeches in Congress, are designed purely for outside effect.—*Prof. Shelton.*

The Manhattan System.

In an appreciative article recently published in the Atchison *Champion*, and a part of which appears in another column, the course of study and training adopted by the Kansas State Agricultural College is referred to as the "Manhattan system." The writer,— who, by the way, is a rising scientist and hence a close observer,— in using this phrase, recognizes the fact that the Agricultural College possesses certain characteristics which distinguish it from other institutions of learning. We accept the phrase, and will proceed to notice a few of these special advantages.

First: Although an industrial school, as thorough and as complete an education — using the term in its popular sense — can be acquired here as in other schools. A student will make as rapid advancement here as elsewhere in the studies pursued, whether he remains one or two years, or through the whole course.

Second: While obtaining a knowledge of English, mathematics, and the natural sciences, every student is learning some useful trade or art. This peculiar feature of the "Manhattan system" is a success. It should no longer be regarded as an experiment. Those who have been here one, two or three years are now in good positions, receiving good wages as telegraph operators, printers, carpenters, etc. Young men who have been through the course in practical agriculture and horticulture are rapidly becoming known as the best farmers in the localities in which they reside.

Third: The expenses are brought down to the lowest possible point. There are no matriculation fees, no tuition bills, no college customs, which compel a useless expenditure for badges or dress. The expenses are simply the cost of living and the text-books used.

Fourth: The high moral and religious influence which exists at Manhattan. The students of the Agricultural College are young men and women of excellent character. Their average age is about eighteen years. They are deeply in earnest in their efforts for advancement. Of course there are a few exceptions, but the vicious or shiftless are soon thrown out. "Attend to business or leave" is the one rule. A wholesome religious influence pervades the Institution. The students' weekly prayer-meeting has been well sustained for more than ten years.

But to fully understand the "Manhattan system" and appreciate its benefits, one must visit us as did our friend from Hiawatha, or enroll his name as a student in the Agricultural College.—*Prof. Ward.*

Kansas State Horticultural Society.

The semi-annual meeting of this Society was held at Beloit, in Mitchell county, on the 17th, 18th and 19th of this month. Members were present from many parts of the State. The verbal reports from the different members indicated a very poor crop of fruit, except grapes, all over the State. The cause was thought to be a rather poor condition of the trees last fall, followed by dry and severe cold weather last winter. As a remedy or rather preventative, we should cultivate well to keep the tree vigorous and mulch to retain the moisture.

Prof. Robson, of Cheever, read a very interesting article on "The Functions of Roots." Messrs. Wellhouse and VanDeman each read articles on grafting, which started a discussion that occupied almost half a day. As the readers of the INDUSTRIALIST have had several articles on this subject this year, it may not be worth while to give the points of the discussion.

The native flowers of Kansas were talked of with much interest. If the people would more generally cultivate such things as our wild sensitive briar, spiderwort, penstamon, and even our wild climbing rose, they would perhaps have better success than many do have.

Small fruits occupied much attention. They should be thoroughly cultivated during May and June, and then thoroughly mulched. Among the novelties spoken well of are the Snyder blackberry and the Turner raspberry. These new fruits are very hardy and of good quality.

The unreliable and swindling tree agents were denounced, but some honorable ones were well spoken of. If an agent has everything you can call for, it is a pretty sure sign that he is a liar.

Hoping to again meet our Beloit friends, we went home, highly pleased with the Solomon valley.—*Prof. Van Deman.*

The Farmers and the College.

It has long and earnestly been contended by intelligent farmers and the rural press generally, that the constant tendency and result of the educational system of the country has been to alienate from the farm the minds of students, and to place their interest and sympathies with the so-called professions. They have said, with great force, that while there were schools of science and literature, commercial schools, and schools of medicine and law, yet schools of agriculture, which involve more of science than either, were unknown. That the farmer's estimate of the inutility of modern systems of education, so far as their calling is concerned, is not far astray, is strikingly shown by the statistics of the different colleges. Thus, of the 622 graduates of Harvard during the twenty-four years previous to 1872, none are farmers. Of the 570 graduates of Wesley University for twenty-eight years, whose occupation is known, one (how ashamed he must feel) devotes himself to agriculture. Yale does better, having 61 farmers among 1,772 graduates; while of the 1,254 graduates of Dartmouth, not one is a farmer. And so we might go on through the whole long catalogue of modern institutions. Had their courses of study been framed for the sole purpose of divorcing the labors of the mind and hand, this work could not have been more successfully accomplished.

To counteract this influence is the great object of the agricultural colleges: or, to speak more particularly of our own Institution, it aims to give to the youth of the State an education such as shall make them better men and women and better citizens, but especially better farmers and mechanics. The course of study has been arranged with especial reference to this object. To this end, the Institution is placed in the center of a large and well-cultivated farm, largely operated by students; and its apparatus, consisting of well-equipped workshops, herds of improved cattle, and growing plants, is designed to illustrate practices rather than principles.

Of those of our farmers who desire that their children shall grow up in sympathy with their own calling, and who desire especially that the great reserve forces of modern thought and scientific methods may be brought to bear upon their profession as it has upon the other arts, we ask that the work and aims of the Agricultural College may receive your attention.—*Prof. Shelton.*

THE INDUSTRIALIST.

SATURDAY, JUNE 28, 1879.

Instead of the usual circular or catalogue, we send the Industrialist to those desiring information about the Kansas State Agricultural College. We would call attention to the articles headed "Departments of Instruction," "Industrial Education," and "Directions to Applicants." If further information is desired, address Agricultural College, Manhattan, Kansas.

The next issue of the INDUSTRIALIST will appear July 26th; and thereafter the paper will be published weekly, as usual.

Mr. M. still continues to *cater* to the people as an undertaker.—*Nationalist.*

Does Mr. M. reside in a community of cannibals?

During the last storm, 3.48 inches of water fell. The total rain-fall for June is 8.43 inches, which is 3.93 inches above the average rain-fall for June at this station.

We aim to send the INDUSTRIALIST to every newspaper in the State, and any paper not receiving it regularly will confer a favor by notifying us by postal of such omission.

Will Burnham is expected to make his Manhattan friends a visit shortly. He has been a cadet at West Point for the last two years, and is now enjoying his first leave of absence.

Another one of the "old boys" has gone and done it. George Gale is the victim this time. On June 14th he was married, near Milford, to Miss Mattie J. Alexander. A worthy couple, may they be abundantly blessed by the Good Father.

Those intending to take boarders next term, or who have rooms to rent, either furnished or unfurnished, are requested to notify Prof. Ward or A. A. Stewart of the fact. There are many who, at this early day, desire to make arrangements for next term.

Miss Julia Rogers, of Burlingame, Miss Clara Elliott, of St. Louis, and Will Bill, of Larned, all old College students, have been visiting friends in Manhattan. The changes and improvements in the city and around the College are far ahead of their expectations.

At their last meeting the Board of Regents took preliminary steps towards fitting up the building recently used for recitation rooms, as a boarding place for ladies. From twenty to thirty will be accommodated with the comforts of a home, at the lowest possible cost.

We see by the Topeka *Commonwealth* that L. B. Rogers has lately been commissioned postmaster at Solomon City. Old students and L. B.'s many friends here will be glad to learn of his prosperity, and of the confidence which the people of Solomon City have reposed in him.

Prof. Hofer, during his residence in Manhattan, has gained a reputation as a fine musician and a man of excellent character. The facilities for learning instrumental music, now afforded at the College, are rarely surpassed.. See Prof. Hofer's advertisement in another column.

Lieut. Albert Todd, of Fort Adams, R. I., is here on a two months' furlough, visiting his parents. Mr. Todd graduated from this Institution with the class of '72, has since passed through the Military Academy at West Point, and now holds an enviable position in the United States army.

The old Boarding Hall has been rented to Mr. Viles, who has contracted to furnish gentlemen students plain, table board at $1.50 per week. Unfurnished rooms, accommodating from two to four persons, at $1.50 a room per month. Those desiring to board themselves can obtain rooms in the old College building.

District boards about to issue school bonds are invited to correspond with us before negotiating elsewhere. We are paying par for first-class 7-10 bonds, issued upon our blanks. Bonds drawn on our blanks are not transferable, and hence may be safely sent by mail at letter postage. Blanks furnished free of charge on application to M. L. Ward, Loan Commissioner.

George Perry and Silas Mason, one a former member and the other a present member of the class in carpentry, are having good success in their chosen vocation. They have lately placed a neat picket fence around Prof. Lee's residence. and are now doing a similar job for Prof. Ward, We are glad to see these boys putting to good use the knowledge they have gained.

George A. Wake and Miss Aggie Woodman were married in Manhattan, on June 10th, by Rev. R. Wake. Both of these parties were former College students, and we know that we express the universal feeling of their old associates when we bespeak for them a full share of this world's enjoyments. They have gone to Ellsworth, where George is engaged in the lumber business.

The College corn-field of twenty-five acres is one about which a little bragging might safely be done. We recently examined that part of the field planted earliest, and found many stalks nine feet high. As this was planted April 11th, the average daily growth has been about 1½ inches. We also found many blades 5¼ inches in width. The corn of this field will average fully seven feet high.

We have frequent applications, from young ladies and gentlemen in distant parts of the State, for situations in families, where they can pay their board, in whole or in part, by work, while attending College. During the last year several young people were enabled to attend College by making this arrangement. Families in town, or in the immediate vicinity, desiring such help, are requested to communicate with Prof. Ward.

We have received flattering reports from the students who entered the book agency business at the close of the term. Wm. Rose has headquarters at Rossville, and D. S. Leach at Topeka. The Chenoweth boys and McBratney, as well as those above referred to, are making good wages. These parties state that they find persons who expect to attend the College the coming year. The prospects for a full school are exceedingly favorable.

In our last issue we referred to the fact that one of our students had, during the past term, cleared expenses and come out $5 ahead. Now comes G. F. Thompson, a student from Cowley county, who "deposes and says" that he commenced the term with $2.50, and at its close, after paying all expenses, he had nearly $15 left. Mr. Thompson earned his money in the INDUSTRIALIST office. He entered the printing class in September, and during that term made sufficient advancement to be able the next term to pay his way by his work; and he always ranked high in his other classes, too. Next!

INSTRUMENTAL MUSIC.

Instruction in instrumental music will be given in private lessons as formerly, and also in classes. The classes will be drilled after school hours, or at such times as are convenient to students. The number of students in each class, on piano or organ, is limited to three.

Instruction will also be given on the various brass and orchestral instruments. Harmony, composition and instrumentation will be taught.

TERMS PER WEEK:

Private lessons, 2 a week, on any instrument, $1.00
Private lessons, 1 a week, on any instrument, .60
Class lessons, 2 a week, on any instrument, .65

Instruction in harmony, etc., etc., from ten to fifty cents per week, as the student may or may not be in other classes. W. L. HOFER.

C. M. Shartell, a Chautauqua county student, has written us a letter, from which we make the following extract: "The Agricultural College is bound to benefit the agricultural interests of this State to a great extent. What we want in farming is more interest, more pride in the profession, more education, and, above all things, more reading farmers. There are thousands of farmers in this State who do not even take a newspaper, who know nothing but work from four o'clock in the morning until nine o'clock at night. I do not see any reason why a farmer cannot have as much leisure for intellectual culture as any other class of people. This working fourteen or fifteen hours a day, no books or papers to read, and poor society, is what is driving thousands of farmers' sons to the cities, as clerks, lawyers, doctors, preachers, —anything rather than to follow in the old ruts of ignorance and overwork. We hope that the Agricultural College will, to a certain extent, raise the intellectual standard of the farmers of Kansas, and effectually do away with the old notion among them that 'a man must be a pig in order to raise one.'" Mr. Shartell says several students from his county will attend the College this fall.

THE GRASSES AND THE DROUTH.

The behavior of the various "tame grasses" growing on the College farm, during the very dry weather which preceded the heavy rains of a week ago, will doubtless be of general interest.

Alfalfa.—With this plant dry weather or wet seem to be a matter of perfect indifference. It commences a vigorous growth as soon as the severe frosts of late winter have ceased; and whether it rain or shine, this plant keeps growing until frosts return again.

For rain may come or rain may go,
Alfalfa goes on forever.

A part of our alfalfa was mowed on May 26th, when a heavy crop of hay was cut; and we are mowing another good crop from the same piece of ground to-day (June 28th).

Orchard-grass.—This old favorite made an early and vigorous start, and during April and the first week of May gave in a large amount of valuable forage. From that time on it failed rapidly; and I have never seen our pastures so embrowned and generally demoralized as they were about June 1st. Immediately after the rains they took a remarkable start, and now our fields are covered with the dense masses of vivid green foliage so peculiar to this plant. This is without doubt one of the most valuable pasture grasses for Kansas; but it needs a rich soil, and we are inclined to think it is partial to a sandy one.

Red Clover.—For the past three years red clover has been gaining in our estimation. It endures dry weather wonderfully well, and springs up rapidly after each rain. It reseeds the ground and constantly thickens and spreads. We cut a good crop of hay the last of May, and another good crop is promised within two weeks.

Kentucky Blue-grass, with us, is far from a success. It made, early in the spring, a small amount of fair feed, and rapidly began to make seed: now it is brown and wiry and in small quantity. The rains seem to have very little effect upon it; and we expect to see it remain thus worthless until the late fall rains set in, when our stock will be in the barn-yard. Taken all in all, this is one of the most worthless of our tame grasses.

Perennial Rye-grass, sometimes called English blue-grass, we have not tried upon a large scale, nor during a great length of time. It is immensely superior to Kentucky blue-grass, and in all respects a very promising sort. It endures dry weather wonderfully, and a "stand" may be obtained about as easily as with oats.

Timothy has suffered more perhaps than any other grass, and so far has made a little feed and no hay. It is too late in the season to expect much of timothy this season, except perhaps a little late fall field. We venture to say that this grass will prove no more, in this part of Kansas, than a "fair weather friend."

In conclusion, we wish to say that, with the exception of alfalfa, no grass endures the drouth better than our much-despised but highly nutritious wild prairie grasses. We wish much that this statement might "give pause" to many of the breaking-plows which, all over the State, are tearing up one of our best crops, and a much more valuable one in many cases than the same ground will ever produce in cultivation.—*Prof. Shelton.*

DIRECTIONS TO APPLICANTS.

TERMS OF ADMISSION.

Candidates for admission must be fourteen years of age, and pass a satisfactory examination in reading; arithmetic, through decimal fractions; and English grammar, to syntax. Classes are started at the beginning of each year in Drill in Arithmetic and Drill in English; and the pupil must have the knowledge above indicated, else he will be unable to retain position if admitted.

Pupils will be received at any time during the year, if able to pass an additional examination upon the subjects studied by the classes which they expect to enter. But they will find it greatly to their advantage to be present at the opening of each term, or as soon thereafter as posssble.

GRADES.

Both the Literary and Industrial recitations are graded daily upon a scale of 100; and an examination of all classes is made at the close of each month. A student not attaining an average grade of sixty is promptly dropped to a lower class, or excluded from the Institution until able to do so. The work of grading is strict and uniform in all the departments, and this process is rigorously used for sifting out incompetent and indolent pupils; thus more than accomplishing all that is designed to be effected by a "high standard of admission." Hence, the student's continuance in the College wholly depends upon his own action.

The course is based upon the determination to make the labor required in the preparation of one industrial and three literary recitations as much as the average student can perfectly perform, in ten hours a day. We design to give the pupil the worth of the time expended at College; and, in order thereto, he must do a full day's work with brain or hand. Only those students who can maintain a standing of ninety in each study will be allowed to take more than the prescribed number of recitations; and no one will be permitted to have less than one industrial and three literary recitations.

RELIGIOUS.

Unless otherwise directed by parents, students are required to attend chapel at 8:30 A. M. on academic days, and divine service once every Sabbath.

EXPENSES.

There are no charges whatever for enrollment, attendance or instruction in the regular courses; nor are there any "contingent fees" for the repair of buildings, for the use of books or apparatus, for diplomas, or the kindred privileges usually grouped under the term "contingent." Male students are furnished instruction, the use of apparatus, instruments or tools, in both the literary and industrial classes marked out for them, without any charge. And the same is true of female students in the regular classes provided for them. Printing and Telegraphy are industrials primarily provided for the education of female students, and male students taking either of these are charged $1 per month for use of instruments.

Instrumental music is a fine art or "accomplishment," rather than a mechanical art. We do not place it among our "industrials" in the same sense, or for the same purpose, that we do those provided for teaching the trades. Accordingly, a fee of $12 per term, or seventy-five cents per week is required from female students for tuition and the use of pianos or organs.

The only charge made for material in either the literary or industrial departments is for the chemicals used by students in laboratory practice, which are furnished at wholesale prices, and amount to but a small sum.

Furnishing an absolutely free education is as much as can be reasonably asked; and the Institution neither boards, clothes, nor supplies the student with text-books. Boarding can be obtained in private families at from $2.75 to $4 per week. Washing costs from seventy-five cents to one dollar per dozen. Text-books, which can be procured in Manhattan, cost from $2 to $5 per term.

No student need expend over $5 per week; and many of our best pupils are living at $1.25 per week. Students desiring to "board themselves" can do so at from $1 to $2 per week. In a club of four young men, renting a house, the average cost to each for the term was $1.11 per week.

LABOR.

Manual labor by the students may be for either of two purposes: First, to acquire skill in a given art; second, to earn money. In the first case, the labor is educational; in the second, it should be paid for by the party benefited.

Educational Labor.—Manual labor in the recitations of the Industrial Departments, like mental labor in those of the Literary Departments, is purely educational and will not be remunerated. While the interest of the student will be held paramount in the direction of this labor, the practice necessary to dexterity will be required.

Remunerated Labor.—When the Institution needs labor on the Farm or elsewhere which is not educational, but simply for its own profit, and which a student is able and willing to perform, it becomes an employer instead of a teacher, and he an employe instead of a scholar. It pays for work, he works for pay. The relation between them is commercial, not educational; and both parties must act upon business principles. Hence, the College furnishes only such employment as its own interests require, and will pay according to the value of the service rendered at from seven to ten cents an hour.

AMOUNT EARNED.

It is impossible to predict how much a given person can earn, since that depends upon what he can do and what work there is to be done. Hence, it is wholly impossible for us to answer the question so often asked: "Do you think I can meet my expenses by work?" Some students make one-half their expenses, some the whole, and exceptional men have made more than expenses. As a rule, a faithful boy skilled in farm work can earn half his expenses on the Farm or in the Nursery. During the year he can ordinarily acquire sufficient skill in the wood or iron shops to enable him to make articles for sale. The whole question is one for his own consideration and decision. We can teach all who come, but cannot absolutely *promise* anything more. Hitherto we have refrained from holding out strong inducements respecting the amount of labor we might have to offer; but in view of the fact that during each of the last three years we have had more to do than the students could perform, we are inclined to give greater and positive encouragement on this point. Any boy who is in dead earnest, who is familiar with farm operations, and who can raise $50 to start with, should be able to carry himself through the four years' course. And certainly this places an education within the reach of every determined boy. As yet we are unable to offer similar advantages to girls, not requiring labor in the College departments which they can perform.

RULES.

1. Behave as a true man or woman should, at all times and in all places.

2. Attend to your own business promptly, thoroughly and courteously; and vigorously let alone that of other people.

3. Penalty: "Leave!"

PUBLICATIONS.

The "Hand-Book," published in 1874, containing a full discussion of the educational question and the aims of the Institution, will be forwarded to any one desiring it.

THE INDUSTRIALIST, a weekly journal edited by the Faculty and published by the Printing Department, contains original and seasonable articles on the Farm, Orchard, Trades, Sciences, and Education. Price, 75 cents a year. Address A. A. Stewart, Manhattan.

CALENDAR.

Fall Term, 1879.—Will begin Wednesday, September 10th, 1879, and close December 18th, 1879.

TO NEW STUDENTS.

Bring the text-books you have been using. On arrival, first arrange for your boarding. A. A. Stewart will furnish information, either by letter or on application, concerning boarding places or rooms for rent. Report to the President at 8:30 A. M., immediately after chapel exercises, for enrollment.

For further information apply to Jno. A. Anderson, President, Manhattan, Kansas.

THE INDUSTRIALIST.

SATURDAY, JUNE 28, 1879.

Industrial Education.

The real value of an education to the student depends upon two things: First, the practical worth of the knowledge taught; and, second, the degree in which he makes it his own. Hence, the ability of any institution to give a practical education depends upon the kind and aim of the knowledge it teaches, and upon the thoroughness of the instruction therein. The State Agricultural College was directly endowed by Congress, and is guided by the State, for the specific purpose of furnishing to the industrial classes of Kansas a "practical" education, that is, "one fit for use." As its name indicates, and as the statistics of the industries of the State require, its chief work must be that of giving a useful and usable education to those who will engage in farming; and, therefore, the Farmer's Course must, from the nature of the case, be its main one.

FARMER'S EDUCATION.

Words and figures are merely instruments with which to record ideas. They are not themselves ideas, nor should they be made the chief end of an education. As a wagon is necessary to haul grain, so are they a necessary part of an education; but as the wagon is not the grain, so they are not the knowledge which the farmer converts into money. Hence, the classics and higher mathematics are not taught. But it will be noticed in the following course that so soon as the pupil acquires working skill in the use of the English language as a tool, and of figures and lines as mathematical tools, those arts and sciences which present knowledge that has a cash value to the farmer are taught as rapidly as their importance and thorough acquisition will permit. Studies numbered (1) and (4) in the second, third and fourth years are the spine of the course, to which the others are as ribs and muscle.

FARMER'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Practical Agriculture (advanced.)		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	
3. Polit. Economy, Practical Law.		3. Practical Geometry.		3. Algebra.		3. Industrial Drawing.	
4. Zoology.		4. Horticul., Landscape Gardening.		4. Practical Agricul. (elementary).		4. English Structure.	
5. Agricul. Chemistry Meteorology.		5. Organic, Analytical Chemistry.		5. Physics.		5. Adv'd Arithmetic, Book-keeping.	
6. Logic.		6. Practical Surveying.		6. Industrial Drawing.		6. U. S. History, Industrial Drawing.	

WOMAN'S EDUCATION.

Nearly one-half of our students are females, and the Woman's Course is prepared expressly for their liberal and practical education. We have no doubt whatever that practical men and women, who understand what it means and what it seeks to do, will fully endorse it.

WOMAN'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Farm Economy, Special Hygiene.		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	
3. Polit'l Economy, Practical Law.		3. Industrial Drawing.		3. Industrial Drawing.		3. Industrial Drawing.	
4. Zoology.		4. Horticul., Landscape Gardening.		4. English Literature.		4. English Structure.	
5. Phys'l Geography, Meteorology.		5. Organic, Household Chemistry.		5. Physics.		5. Adv'd Arith., Book-keeping.	
6. Logic.		6. Household Economy.		6. Industrial Drawing.		6. U. S. History, Industrial Drawing.	

MECHANIC'S EDUCATION.

Because of the adaptedness of the leading course to the wants of the intelligent mechanic, it has been found practically unnecessary to diverge from the Farmer's Course. Additional studies, specially adapted to the mechanic's use, will be furnished in a Post-Graduate's Course.

If it be urged that the distinctively agricultural knowledge taught in the Farmer's Course is not directly valuable to the mechanic, we reply that, admitting the point for the purpose of argument, yet: 1. This knowledge is of more practical value to the mechanic than is the Latin, Greek, or a half dozen other things embraced in the usual course preparatory to the professions; 2. That the great majority of Kansas mechanics will also be more or less engaged in agriculture; 3. That those studies in the course which are directly valuable to the mechanic, together with the shop facilities, offer a better mechanic's education than can be elsewhere found west of the Alleghanies.

INDUSTRIAL DEPARTMENTS.

Having knowledge in the head is one thing; ability to use it with the tongue, fingers or feet is quite another thing. Both are vital to success in practical life. A man might thoroughly understand the theoretical principles of carpentry, and yet, not having used the tools, be wholly unable to earn carpenter's wages. So in all other vocations. Accordingly, instruction is given in the following well-equipped Industrial Departments, and every student is required to recite in some one of them, as selected by the pupil or parent:

FOR MALE STUDENTS.	FOR FEMALE STUDENTS.
The Farm.	**Dress-making.**
The Nursery.	**Printing.**
Carpentry.	**Telegraphy.**
Cabinet-making.	**Scroll-sawing.**
Turning.	**Carving.**
Wagon-making.	**Engraving.**
Painting.	**Photography.**
Blacksmithing.	**Instrumental Music.**

Each of these departments is conducted exactly as in daily life, and aims to give precisely the drill received by an apprentice. No charge is made, either for tuition or material, from male students taking the Industrials provided for them; nor from female students taking the ones provided for them, except in Instrumental Music. Male students taking either Printing or Telegraphy are charged $1.00 per month for the use of instruments and material.

DEPARTMENTS OF INSTRUCTION.

DEPARTMENT OF AGRICULTURE.

PRACTICAL AGRICULTURE.

Second Year:—General principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage.

Fourth Year: General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of a rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farmhouses; barns.

FARM ECONOMY.

Woman's Course, Fourth Year: Dairy products as human food; influences affecting character of milk; manufacture of condensed milk; the factory system and household plan of cheese-making; treatment of rennet; general process of cheese manufacture; subsequent treatment of cheese; butter-making; creameries; "deep" and "shallow" setting systems; general process of butter-making; packing and preserving butter.

DEPARTMENT OF BOTANY AND PRACTICAL HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest; also a course of lectures on Landscape Gardening. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard; fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture; shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in in the work of laying out and plotting grounds topographically.

CHEMICAL DEPARTMENT.

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life. Text-book, Ganot.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blowpipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

Are constantly in progress in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

DRILL IN ENGLISH.

"As grammar was made after language, so ought it to be taught after language."—*Herbert Spencer.*

Drill in English embraces the following topics:

Sounds of the language; drill in producing the vocal, sub-vocal and aspirate elements with accuracy, distinctness and volume; vowels, consonants.

Letters: Form; power; rules for spelling, drill.

Words: Signification, properties, modifications, variations, relation and dependence.

Sentences: Drill in statement of ideas; description, clearness, terseness, vigor; business letters, discussion; capitalization; syllabication; punctuation; construction and analysis of sentences; elements, uses and names; criticism of compositions printed as written; proof reading; grammatical construction; superfluous words and clauses; drill in reading, speaking and penmanship.

Text-books: Webster's Academic Dictionary; Lee & Hadley's Advanced Lessons in Language.

Pupils deficient in spelling, etc., should enter the printing class, the printing-office being the work-shop of language.

STRUCTURE OF ENGLISH.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

MATHEMATICAL DEPARTMENT.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

DRILL IN ARITHMETIC.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Following this line, the student, so far from hammering away at "pure" science draws from the mathematical store-house what he needs, and sees why he needs it. Accuracy of calculation and posting, rather than a *mere* comprehension of the principles, is aimed at. Besides the recitation-room drill in business forms, practice in the field is also given. Estimating the number of cords in a pile of wood said to be 100x4x4 feet is one thing; measuring a pile of wood through which any number of cats may be harmlessly thrown, and in which four-feet sticks are the exception, is quite another and more difficult thing.

ARITHMETIC AND BOOK-KEEPING

Is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides ensuring arithmetical practice, develops practical skill in that important art.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admiral system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study. In addition, constant practice in the application of lines to metal and wood is furnished in the Blacksmith, Carpenter, Turning, Scroll-sawing, Carving, Engraving and Printing shops, and to fabrics in the Sewing Department.

PRACTICAL GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the use of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

PRACTICAL SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

STUDIES SPECIAL TO WOMAN.

Besides the studies already indicated, attention is called to the following:

SPECIAL HYGIENE.

As shown in the course, one term is devoted to the study of Physiology, from the text-book of Dr. J. C. Dalton. This is followed in the fourth year by a course of lectures to young ladies by Mrs. Cripps on the subject of Hygiene, embracing such instruction in hygienic matters as are valuable to woman.

FARM ECONOMY considers those affairs of the farm which usually come under the supervision of the farmer's wife or daughter, and which are not included in "gardening" or "household economy;" such as butter and cheese-making, dairy management, etc. A course of lectures is delivered by the Professor of Practical Agriculture. See heading, "Farm Economy."

GARDENING is included in Practical Horticulture. See heading, "Landscape Gardening."

HOUSEHOLD CHEMISTRY. See heading, "Household Chemistry."

HOUSEHOLD ECONOMY

Follows Household Chemistry and consists of lectures by Mrs. Cripps on the art of house-keeping, embracing cookery, domestic management, and kindred topics. Many elderly gentlemen sufficiently know, and more young gentlemen will duly discover, that systematic knowledge of how cooking ought to be done is luminously different from the ability to do it. Instruction without practice can effect but little. Accordingly, a kitchen laboratory has been completely furnished, and affords every facility for drill in the art of cooking. This drill chiefly differs from that of a kitchen in the respect that after a girl has learned to wash dishes or pare potatoes she is not kept everlastingly at either. After full trial, we have found it just as feasible to give this practice, with profit and pleasure to the pupil, as it is to give laboratory practice in chemistry,—and no more expensive.

THE INDUSTRIALIST

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The Future Farmer.

He who would excel in anything must be something more than a good copyist. He must in some respects be original, and approach an ideal standard. So the farmer of the future must be something more than an imitator of the farmer who has gone before. He must strike boldly out into the field of modern science—a field at present comparatively easy to explore. Everything looks to the future farmer for success. Every year it is becoming more and more apparent that the farm must be the balance-wheel of the nation,—that it must in a great degree govern, regulate and control every other branch of industry. His is the most stable, permanent business. Agriculture alone, it may be said, is anchored to the soil. All else is comparatively fleeting and transitory. Hence it is meet that the owners of the soil shall be the rulers of the country. We mean the actual owners of the land,—those who gain their daily bread directly from the soil by personal supervision and labor.

Preliminary to this step agriculture must be infused with a higher culture; and the agricultural college properly conducted—lifted from the schoolman's plan—offers the ready medium for this reform. When the agricultural college has been reformed, or rather perfected,—for as yet it is but a feeble imitation of the old European institutions of classic literature, a slavish copy of which all our colleges and seminaries are,—it will become fashionable, and the wealthy of other pursuits will be eager to patronize it and to send their sons to it to receive an education.

As the case now stands, the world boasts of "ripe scholars" as professors to teach the book lore of dead ages; eminent lawyers, learned in all that pertains to that profession; model preachers, great divines, thoroughly acquainted with all the creeds and superstitions of ancient and modern times, requiring immense labor and research into black letter and dead lore. These, and many others with cabalistic letters punctuating their individuality—LL.D., M.D., D.D., etc., etc. Agriculture alone, among these ancient orders, is without honors or titles.

But the shams which have so long succeeded in hoodwinking the world are fast losing their power, as the clear, bright sunlight of true science dispels the fog in which they have been so long enveloped. The day is fast approaching and the time near at hand when a professor of agriculture will mean something. All the vital learning of an ever living present is hers to appropriate and use to the lifting up of the human race.

Let us see what the model farmer of the future must be master of and acquire for *use*,—not to be worn as a button-hole bouquet. He must be a geologist and learn to read the rocks, and be acquainted with old Earth's formation; a chemist, and be able to use his laboratory, where the constituents of the soil, the mysteries of plant life, the pulling down and building up of organic matter, are made plain; familiar with botany, which classifies and names the plants, shrubs and trees that are the constant companions of the farmer; a master of entomology, which points out the friends and enemies to the farm's crops, of swarming insect life; an ornithologist, no less useful than beautiful, and when he has learned the habits of the feathered tribes, he will have the acquaintance of hosts of tireless friends which he had never before dreamed of. Architecture, engineering and hygiene, in the farm vocabulary, signify beauty, convenience and health. Without these, country life is shorn of the greater part of its riches and enjoyment. Meteorology has almost as strong claims on the farmer's attention as the mariner's. By it he is made familiar with the winds, the clouds and storms, cold and heat, and learns the effect of atmospheric changes on his soils, his crops and animals. Surely here is a field in knowledge large enough for the most sublime ambition, and attractive enough to win the smartest boys. Every agricultural college should embrace in its curriculum these studies, not as adjuncts but as primary, and a basis on which the whole superstructure of the pupil's education is to be built, and which should progress with an eye single to practical results,—to the money it would be worth when in future it was applied to conducting a farm.

All boys could not become proficient in all these branches, but all could acquire a rudimentary knowledge of them to be improved by future study, many would acquire a practical knowledge of a number of them, and not a few would become proficient in all. The contest in the schools of to-day is for a useful, business education, and the exclusion of the large per cent of useless or unusable which is taught from the public school up to the college.

When farmers' boys are taught in the line of their life-work, as lawyers, physicians, clergymen, soldiers, etc., have always been taught, they will begin to take a front rank in society, and exert a controlling influence in the State, which learning, coupled with numbers, will always command.—*Kansas Farmer.*

Price of Grain Likely to be High this Season.

In a public speech, some months ago, the Earl of Derby conceded that, in view of the unlimited facilities possessed by this country for producing all cereals cheaply, and of the impossibility of re-establishing the old-time corn laws for the protection of domestic agriculture, the time was close at hand when the British farmer should abandon grain-growing and seek his profit in meat production, leaving the supply of breadstuffs to the bountiful harvests of this country. Despite the late reductions of rent, pretty general throughout the country, hundreds of good farms have this year and last been thrown upon the hands of the landlords, because farmers feared that they would be unable to "make both ends meet" if they rented them. Such abandoned farms are, in nearly all cases, turned into meadow or pasture lands, so that the area under cereals in Great Britain is rapidly diminishing every year, while the population is increasing at the rate of 1,000 a day. Already Mark Lane and other English grain markets have ceased to be affected by changes in the weather beneficially or injuriously affecting domestic crops. Last week the telegrams reported that the weather throughout the British Isles was very unfavorable to the crops, and that at a critical season; but they also reported that in view of the slight dependence lately placed on the home supply, and the bright crop prospects announced from this side of the Atlantic, the grain markets had remained unaffected by the unseasonable weather.

Last Saturday the French Ministry announced that, in view of the scant harvest this season throughout the greater part of the country, France would have this year to import $100,000,000 worth of foreign grain. As a rule, that country is an exporter of cereals to a considerable extent, so that this year not only will those countries which have a surplus of cereals have to supply nearly $100,000,000 worth of grain to the French market, but they will also have to furnish to other countries, chiefly to Great Britain, the quantity hitherto drawn from France.

The latest advices from southern Russia, our chief competitor in the grain markets of the world, are highly unfavorable. Wind and rain-storms have greatly injured the crops in the territory tributary to Odessa, while swarms upon swarms of locusts have ravaged many parts of the country. From Germany, late crop reports are good; but it is hardly probable that there will be much of a surplus of any, except tobacco, for exportation. There is considerable agitation in Spain for the repeal of duties on importations of cereals; but, in view of the fair outlook for the domestic harvest, the ministry this year have felt themselves strong enough to concede only a slight diminution of the tax on imports of flour. Italy is pretty sure to be one of our customers, or at any rate she will not be able to spare any cereals to compete with ours in other markets.

On the whole, the grain crops in Europe this year are very considerably below the average, and the deficiency is precisely in those countries in which it will do us the most good. Great Britain and France are, both by situation and friendliness, naturally our greatest customers; and as both are wealthy, they are also our best. As in both of these the harvest is especially small, their demands on our surplus will be especially large. Moreover, the mishaps that have lately befallen crops in southern Russia, by crippling our greatest rival, will raise the price of our products by curtailing exportations from that quarter.—*Rural New-Yorker.*

The Century Plant.

Some years ago I read a statement in a New York paper that only four century plants had bloomed in the United States. I suspect that it is not everywhere known that this singular plant is a spontaneous growth of a considerable region in southwestern Texas, between the Nuces and Rio Grande rivers. There may be seen the century plant in all of its phases, from the little sprout that starts from the base of its mother plant to those which hold aloft their great clusters of white waxy flowers. Then, here and there, like lonely sentinels, stand the old dry trunks of those which have bloomed in former years, while scattered around lie those that have fallen from the decay of age.

My best information is that the century plant, when confined to the narrow quarters of a green-house pot, and the unnatural atmosphere of a northern conservatory, requires an age of from seventy to one hundred and twenty years to produce its blooms. But when it has its roots spread freely out in a warm southern soil, and receives the full force of a hot southern sun, it will bloom in from twelve to fifteen years. People from Mexico tell me that in some parts of that country it will bloom in from four to six years. As soon as its seeds are ripe it has reached its complete maturity and dies.

I have a plant in my yard which is now seven years old. It stands about eight feet high, is about ten feet from tip to tip of the leaves, and has leaves that I think would weigh a hundred pounds. From this plant I have raised plants so abundantly that, besides what I have sold to my nursery customers and given away, I yet have a border about one hundred and twenty-five yards long, and expect to plant a defensive hedge this season about two hundred yards in length.

It grows in any soil. No situation is too dry for it. It will flourish in the dryest chalk hills as well as in a rich alluvial soil. It not only defies drought, but glories in the hottest sunshine of our climate, and, in fact, is hardy against everything but *cold*. A plant may lie with roots exposed for a month to *our* August sun without a drop of rain, and then grow rankly if planted.—*G. Onderdonk, in the New York Observer.*

THE INDUSTRIALIST.

SATURDAY, JULY 26, 1879.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

As the time for beginning the Fall Term of 1879 has been slightly changed from previous dates, the press will confer a favor upon the College by publishing the following announcement:

The Fall Term of the Agricultural College begins Wednesday, September 10th, 1879, and closes December 18th, 1879.

Another Agricultural School.

In early times the Jews were a pastoral people; but for eighteen centuries they have been scattered over the earth as a nation without a country, as individuals without permanent abodes. It appears, however, that this strange people are making an effort to return to the pursuit of their remote ancestors. At a late meeting held in New York, largely attended by representatives from thirty different States, it was decided to establish an Agricultural Training School, where the Jewish youth, most of whom are reared in cities, can learn practical farming. The scheme further contemplates establishing colonies of Jewish families in the West.

WE can never raise schools to the highest condition of usefulness without ready, constant and cheerful parental co-operation. Too many parents think that their responsibility ceases when they send their children to school. It is true that most of the daily work — the actual teaching — must be performed by the instructor; but parents may do much to encourage, stimulate and assist both teacher and pupils. By sending their children seasonably and constantly, by visiting the school, by sustaining the authority and discipline of the school, and in many other ways, they may prove helpful to the teacher. If the German maxim, "As the teacher, so the school," is true, is it not equally a fact that, "As the parents, so the teacher and the school"?

AND now comes a new departure in education and journalism,— a floating college and a traveling newspaper. A faculty of ten professors (W. S. Clark, LL.D., late President of the Massachusetts Agricultural College, President,) on shipboard, to make a voyage around the world. An illustrated newspaper, to be published weekly and mailed to its subscribers in all parts of the globe. Subscription price of the newspaper, $5.00 for seventy-eight numbers. Expenses to each student for entire voyage, $3,000. All these items and much more can be learned from *Around the World*, the newspaper referred to, a copy of which has been received by us. Specimen copies will be sent to any one addressing Woodruff Expedition, St. Nicholas Hotel, New York.

The Cause of it.

As hot June closes the doors of our colleges and universities, and their printed reports reach our table, we observe that many of the more conservative institutions are complaining of a decline in the number of graduates. Now, what can be the cause of this lamentable fact? We ascribe it, in a great measure, to the neglect of a closer adjustment of college courses to the demands of the time.

The college of the past expended, as a rule, its chief strength upon classics. We do not deny that there is some value in that exclusive culture; but the prodigious advances in science make it absurd for a man to call himself tolerably educated without a fair knowledge of these branches. Then there is a steadily increasing call to the fields of social science. Modern languages, particularly German, are also emphatically required in a modern education. The necessary consequence is that if our colleges are to give the required learning and culture, they must either do less with the classics or prolong their courses almost indefinitely. Many of these colleges are unwilling to do the first; the second cannot well be done, though in general a little inflation would not hurt; and as the pressure from without is increasing, many of the more conservative institutions begin to resist. The result is, that a majority of students withdraw prematurely and enter special schools. Young America is impatient.

A change in the so-called "learned professions" has done much in favor of this short-cutting. Theological education has yielded to the popular demand. The minister's Greek and Hebrew amount to little nowadays. He must know what Huxley, Darwin, Haeckel, Spencer or Draper are doing; he must give careful thought to evolution; he should know something of embryology; origin of species must occupy his thoughts as well as origin of verb roots: in short, a reliance on the weapons of Luther alone would endanger him to become a Knack. But, as the old-fashioned university denies him what he wants, he gathers a few essentials and hastens to the seminary, with a view of adding, by private reading, whatever he thinks he will need of general knowledge.

Medicine is rapidly ceasing to bear the claim to be called a "liberal art." Statistics show that of the hundred and fifty-three graduates from the Philadelphia Medical School in 1873, only three were college graduates. Other medical institutes show similar ratios. It cannot be denied that the impression is gaining ground, even in the "learned professions," that the classics do not pay for the time they consume, at least if measured with the rich returns that reward the study of the sciences.—*Prof. Walters.*

1869 and 1879.

While looking through a file of the old Manhattan *Standard*, of 1869, L. R. Elliott, editor and proprietor, I struck the following editorial: "As a community we have not fully appreciated the value of the College as a fixture here. And perhaps many of us, even now, do not understand the magnitude and importance of the Institution as it will appear at the end of the next decade or two, when it shall have been developed as contemplated and provided for in the Act of Congress that endowed it, and the State that accepted the endowment and located it here."

The first of the grace decades of which the *Standard* speaks is now completed, and it will be interesting to investigate the character of the prophecy. In 1869 we find a purely literary College, that confesses in its own reports its inability to do much for agriculture, promising, however, "that all that pertains to this department will be developed as fast as possible." To-day, to quote a leading agricultural journal, "it is the leading practical farmer's school in the Mississippi valley." In the records of 1869 we find 173 students enrolled, of whom 134 belonged to the preparatory school. During the calendar year of 1877 we find already 228 students, and during 1878 there were 238 in attendance; and this while the preparatory has been abolished,— the average age of students in attendance the two years last mentioned being 18.14 years. In 1869, of the 34 students in the College proper, 23, or fully two-thirds, were from Manhattan and immediate vicinity; and of the pupils of the preparatory, over one-half belonged to the near neighborhood of the Institution. Twenty counties were represented in the roster. In 1877 only 16 per cent of the whole number were from Manhattan, and in 1878 only 8 per cent; and the representation by counties and States had increased to 51.

These figures show that the College is now a State institution, while ten years ago it hardly could claim that much. The teaching force now numbers 12 against 8 in 1869. From 1863 to 1871 the College graduated only 5 students, while from thence up to date 42 have received their diplomas. Instead of the dry, poor campus of eighty acres on the Wild Cat hills, the College now possesses a well-located and highly-cultivated experimental farm of 160 acres, adjoining the town site. We now have a labyrinth of stately new buildings, each designed and built for its special use. We have a large and practical barn, "one that realizes even Prof. Shelton's ideal," built at an expense of $4,000; one of the best planned and most substantial laboratories on the continent, costing $8,000; a horticultural building; a large two-story workshop; etc. A herd of pure-bred cattle, a nursery, a vineyard, an orchard, and other necessities of a farmer's school, are substantial fixtures of our Institution. In 1873, when the present management assumed control of the affairs of the College, there was a debt hanging over the Institution which amounted to nearly $42,000. To-day this debt has been reduced to less than one-seventh of the original sum.

Yet, after all, these glowing statements are only dry figures, proving nothing except that the Institution has grown in age and numbers. The real value of a college consists not in marble structures, costly apparatus, in the number of its teachers and students, nor in the shelves of its library. It is the inside work — the culture and knowledge which it imparts — that constitutes the merit of an institution of learning. When the *Standard* speaks of "magnitude and importance," it refers to the honest and faithful work done in the class-rooms, workshops and studies; and here we will modestly state, with a friend of the College, that "the student who enrolls his or her name upon the records of this Institution has a guarantee that the return shall be that which commands cash in the market. The scientific farmer, demonstrating by actual practice that which he has been taught while a student here, when asked by his less fortunate neighbor the secret of his success, can point with pride to his Alma Mater."—*Prof. Walters.*

Meteorological Notes.

The present is a phenomenal season. Predictions of the weather for longer periods than forty-eight hours have served but one purpose — to prove the unreliability of the prophet. The signal service, by means of tri-daily operations, is enabled to give quite accurate weather indications for the succeeding twenty-four hours. During the month of May last the verifications were eighty-three per cent. By the reports from all over the country, all the elements of a storm's progress are known, and it may be determined with a fair degree of accuracy in what portion of the storm's path any particular place may lie, as well as when it will pass over the place.

As an indication of the facts reported to the chief signal officer, but principally to show the course of what proved to be one of our most devastating storms, I quote the following from the *Monthly Weather Review*, May, 1879:

"An area of low barometer was developed during latter part of 29th and morning of the 30th over the high lands of northwestern Texas. On the 30th, 4:35 P. M. (Washington time), brisk southerly winds over Texas increasing to high over Indian Territory, with a general temperature of from 90° to 100°; easterly winds and threatening weather in the Lower Missouri valley; northerly winds over western Nebraska and Kansas, increasing to NW. 44 miles at Dodge City, and of a temperature ranging from 60° to 72°. Snow fell on the mountains around Denver and Santa Fe, and by morning of the 31st the thermometer fell to 10° on summit of Pike's Peak. From 4 to 10 P. M. several tornadoes swept over portions of eastern Kansas, southeastern Nebraska, and northern and western Missouri, brief notice of which will be found under the head of *Local Storms*. The general direction of these tornadoes appears to have been uniformly northeastward, corresponding with that of the center of depression. Along the immediate northern margin of this track a heavy rain fell on night of 30th. On the 31st, center of depression increased in area with rising pressure and decreasing energy, and by 4:35 P. M. formed an elongated trough extending from Arkansas and Missouri to southern Michigan, attended by cool and brisk northerly winds over the Upper Lakes, Northwest and Eastern slope, and by southerly winds from the Ohio valley and Lower Lakes south and eastward. Throughout the day cloudy and rainy weather, with occasional heavy thunderstorms, prevailed from the Southwest to Tennessee, the Lake region and Iowa."

Under head of "Local Storms," as referred to above, occurs the following:

"May 30th, lower temperature prevailed in Missouri and Kansas; and the advancing edge of the area of cold NW. winds, passing eastward over western Nebraska and Kansas, was accompanied by severe local thunder and hail-storms, and in some places by tornadoes. At 4:35 P. M., Washington time, (or 3:15 P. M., local time on the 97th meridian,) an oval area extended for 300 miles from west of Fort Sill to south of Omaha, and having a shorter diameter of about 50 miles; towards this the winds were blowing from all directions, being warm, brisk SW. on the east side, and cold, high NW. on the west side. At 11 P. M. this area is represented by a smaller one of lower pressure in southeastern Nebraska and two of converging winds respectively in SE. Iowa and central Missouri. Severe tornadoes or equivalent local storms occurred between 3 P. M. and 11 P. M."

The track of the center of area of low barometer, as well as I can determine from the signal service map, passed almost directly over Manhattan. These areas of low barometer, with winds blowing inward from every direction, are passing in succession over the continent, with a general course north of east. It is only occasionally that the tension becomes so great that a tornado is produced by the upward flow.

The rain-fall at this station for the month of May was 1.79 inches, which is 2.33 inches below the mean for this month at this place. The average precipitation for June is 4.50 inches; during last June 8.43 inches were collected in the rain-gauge. The average for July is 4.81 inches; during the present July (to the 26th) it is 4.86 inches.

It has been established by the observations taken by our signal service, and by all other observations, that there is a certain constancy in the annual precipitation. An excess in one direction is followed by an excess in the other; and thus the average is maintained. This seems to be the most reliable means of forecasting the rain-fall of a season or a year. The years '74 and '75 were dry ones. Then followed '76, '77 and the fore part of '78, very wet. The latter part of '78 and fore part of '79 comprise a dry period. We are now in the midst of a rainy period, but how long it will last we know not. While it is not to be supposed that the excessive rain-fall of the past few years is balanced by the preceding and subsequent deficiency, there is no good reason to apprehend a disastrous drought soon. All predictions of a drought, to begin at a fixed time, seem to be founded on insufficient data, and do not receive the serious attention of scientific men.—*Prof. Failyer.*

THE INDUSTRIALIST.

SATURDAY, JULY 26, 1879.

Instead of the usual circular or catalogue, we send the Industrialist to those desiring information about the Kansas State Agricultural College. We would call attention to the articles headed "Departments of Instruction," "Industrial Education," "Special Advantages," and "Directions to Applicants." If further information is desired, address Agricultural College, Manhattan, Kansas.

SPECIAL NOTICES.

Those intending to take boarders next term, or who have rooms to rent, either furnished or unfurnished, are requested to notify Prof. Ward or A. A. Stewart of the fact.

The old Boarding Hall has been rented to Mr. Viles, who has contracted to furnish gentlemen students plain, table board at $1.50 per week. Unfurnished rooms, accommodating from two to four persons, at $1.50 a room per month. Those desiring to board themselves can obtain rooms in the old College building.

We have frequent applications, from young ladies and gentlemen in distant parts of the State, for situations in families, where they can pay their board, in whole or in part, by work, while attending College. Families in town, or in the immediate vicinity, desiring such help, are requested to communicate with Prof. Ward.

District boards about to issue school bonds are invited to correspond with us before negotiating elsewhere. We pay par for first-class 7 per cent bonds, issued upon our blanks. Bonds drawn on our blanks are not transferable, and hence may be safely sent by mail at letter postage. Blanks furnished free of charge on application to M. L. Ward, Loan Commissioner.

The time-table on the Kansas Pacific has been changed. Read it.

And now there is rejoicing in Prof. Shelton's family. It is a girl!

We wish every student would send us a few items of news each week.

The rain-fall at this station for July (to the 26th) is 4.86 inches, which is above the average for this month.

Prof. Failyer and wife started for the Mountains last Wednesday evening. They expect to be absent about a month.

Prof. Shelton has been quite sick for several days, and unable to attend to his farm and editorial duties. We are glad to report that he is recovering.

The trees around the College buildings have been nicely trimmed during the last week, and the appearance of things hereabouts has been much improved thereby.

The Board of Regents will meet in Manhattan on Tuesday, August 5th, at which time all accounts against the College will be audited, and other important business transacted.

The Riley County Teachers' Institute is now in session in Manhattan. There are about sixty persons in attendance, and a good interest is manifested. We shall say more about it next week.

President Anderson and family, who have been visiting in New York since the adjournment of Congress, are expected home next week. Their friends look forward with pleasure to their return.

The Kansas press, which has so often shown its kindness to us, has again made us its debtor by retaining us on the exchange list during the vacation. Brethren, some day we hope to return the favor.

Mr. A. E. Sternberg, one of our old students, made us a pleasant call yesterday morning. He has charge of one of the K. P. depots out on the plains, but is now enjoying a three weeks' leave of absence.

J. A. Sloan writes from Wakefield that he will be with us again at the opening of the next term. He says the National Land Company has had seven sections of land broken up south of his home, with the intention of seeding it to wheat.

Some fine stereoscopic views of College and city buildings, and of the scenery in and around Manhattan, have lately been made by a traveling artist. Copies of these views can be procured at S. M. Fox's book-store for twenty-five cents each.

The Ellsworth *Times*, after speaking of a "pleasant visit" to the Agricultural College, closes by giving its young readers this advice: "We feel like saying to all young people, If you want a practical education, attend the Manhattan Industrial College."

Mrs. Wahl informs us that her place on Bluemont, known as the Davis property, is for sale or rent. The place is located conveniently to the College, and parties who think of coming here for the purpose of educating their children would do well to see her.

With this number the INDUSTRIALIST resumes its regular work. It seems good, after years of unceasing toil, to have a vacation, even if it is cut short at both ends. But life to us means work, and so without a murmur we step into the harness for another pull.

Mr. C. Poirier, of Wathena, who owns a grapery of forty acres in Doniphan county, paid us a visit this week, and was astonished to see what a work the College is doing for the youth of Kansas. He was accompanied by two sons who will attend the Institution this year.

We have a little "land-*scrape*" gardening "right in front of the horticultural building" which we would be pleased to have the Manhattan ladies visit. Nearly all the flowers are in bloom, and the beds are now looking their prettiest. Come up in the cool of the evening and enjoy their fragrancy.

A great deal of hard work has been done on the College farm this season. To keep down the weeds in the face of the warm sunshine and frequent rains has been a difficult task. But the boys have succeeded admirably, and we certainly think the Hill never looked so lovely as at present.

Albert Foreman is clerking in a store at Randolph. Miss Ella Coburn is attending the Saline County Teachers' Institute. Ed Coleman is working on a farm five miles from Manhattan. Emma Adams and Allie Peckham are visiting in the East. Henry Randel is plowing in one of the great wheat-fields west of us. Frank Abbott runs a lumber yard at Wakefield for Gale & Co. C. S. Buell has gone to Binghampton, New York, to settle an estate. W. K. Eckman is employed on the Osborne County *Farmer*. J. D. Hartmann is working near Wakefield. C. S. Hotchkiss has been laying stone on the new Manhattan flouring mill. Fred Jewell and George Rose are engaged on the College farm. Mark Reeve and Orpheus Durkee are laboring under the head of "miscellaneous business." Jim Lynch is carpentering out on Chapman Creek. E. C. Paine works for Mrs. Cripps. B. L. Short lives with Prof. Ward. Wm. Wahl is in a printing-office at Ellsworth. And thus in different ways the students are spending the vacation.

SPECIAL ADVANTAGES.

We enumerate a few of the special advantages which the Agricultural College presents to the young people of the State of Kansas:

First: Although an industrial school, as thorough and as complete an education—using the term in its popular sense—can be acquired here as in other schools. A student will make as rapid advancement here as elsewhere in the studies pursued, whether he remains here one or two years, or through the whole course.

Second: While obtaining a knowledge of English, mathematics, and the natural sciences, every student is learning some useful trade or art. This peculiar feature of the Agricultural College is a success. It should no longer be regarded as an experiment. Those who have been here one, two or three years are now in good positions, receiving good wages as telegraph operators, printers, carpenters, etc. Young men who have been through the course in practical agriculture and horticulture are rapidly becoming known as the best farmers in the localities in which they reside.

Third: The expenses are brought down to the lowest possible point. There are no matriculation fees, no tuition bills, no college customs, which compel a useless expenditure for badges or dress. The expenses are simply the cost of living, and the text-books used.

Fourth: The high moral and religious influence which exists at Manhattan. The students of the Agricultural College are young men and women of excellent character. Their average age is about eighteen years. They are deeply in earnest in their efforts for advancement. Of course there are a few exceptions, but the vicious or shiftless are soon thrown out. "Attend to business or leave" is the one rule. A wholesome religious influence pervades the Institution. The students' weekly prayer-meeting has been well sustained for more than ten years.

NATIONALIST ITEMS.

Wild plums and grapes are in the market.

There was a heavy rain Tuesday night, extending out to the plains, where it stopped a passenger train.

O. Dodge has purchased the Tuttle farm—on Tuttle Creek. It contains 240 acres and sold for $1,500.

Several of the exodites have already purchased town lots with their savings, and are preparing to build.

And now the complaint begins to be heard that it is difficult to get eligible building lots at fair prices.

And still the corn keeps booming. The prospect for a heavy crop was never better than it is now.

A great many of our citizens are going to Colorado to attend the Scientific Convention in the mountains.

The Guards have received an invitation from D. Shelton to attend the National Temperance Camp-Meeting in August.

A little boy of Mr. Morgan's, on College Hill, stepped on a rake about a week ago and received a serious injury, the tooth going clear through his foot. He was doing well at last accounts.

That neat little paper, the INDUSTRIALIST, again makes its appearance on our table, and after the 26th inst. will be a welcome weekly visitor.—*Salina Herald.*

DIRECTIONS TO APPLICANTS.

TERMS OF ADMISSION.

Candidates for admission must be fourteen years of age, and pass a satisfactory examination in reading; arithmetic, through decimal fractions; and English grammar, to syntax. Classes are started at the beginning of each year in Drill in Arithmetic and Drill in English; and the pupil must have the knowledge above indicated, else he will be unable to retain position if admitted.

Pupils will be received at any time during the year, if able to pass an additional examination upon the subjects studied by the classes which they expect to enter. But they will find it greatly to their advantage to be present at the opening of each term, or as soon thereafter as posssble.

GRADES.

Both the Literary and Industrial recitations are graded daily upon a scale of 100; and an examination of all classes is made at the close of each month. A student not attaining an average grade of sixty is promptly dropped to a lower class, or excluded from the Institution until able to do so. The work of grading is strict and uniform in all the departments, and this process is rigorously used for sifting out incompetent and indolent pupils; thus more than accomplishing all that is designed to be effected by a "high standard of admission." Hence, the student's continuance in the College wholly depends upon his own action.

The course is based upon the determination to make the labor required in the preparation of one industrial and three literary recitations as much as the average student can perfectly perform, in ten hours a day. We design to give the pupil the worth of the time expended at College; and, in order thereto, he must do a full day's work with brain or hand. Only those students who can maintain a standing of ninety in each study will be allowed to take more than the prescribed number of recitations; and no one will be permitted to have less than one industrial and three literary recitations.

RELIGIOUS.

Unless otherwise directed by parents, students are required to attend chapel at 8:30 A. M. on academic days, and divine service once every Sabbath.

EXPENSES.

There are no charges whatever for enrollment, attendance or instruction in the regular courses; nor are there any "contingent fees" for the repair of buildings, for the use of books or apparatus, for diplomas, or the kindred privileges usually grouped under the term "contingent." Male students are furnished instruction, the use of apparatus, instruments or tools, in both the literary and industrial classes marked out for them, without any charge. And the same is true of female students in the regular classes provided for them. Printing and Telegraphy are industrials primarily provided for the education of female students, and male students taking either of these are charged $1 per month for use of instruments.

Instrumental music is a fine art or "accomplishment," rather than a mechanical art. We do not place it among our "industrials" in the same sense, or for the same purpose, that we do those provided for teaching the trades. Accordingly, the following fee is required from female students for tuition and the use of instruments:

Terms per week:

Private lessons, 2 a week, on any instrument,	$1.00
Private lessons, 1 a week, on any instrument,	.60
Class lessons, 2 a week, on any instrument,	.65

Instruction in harmony, etc., etc., from ten to fifty cents per week, as the student may or may not be in other classes.

The only charge made for material in either the literary or industrial departments is for the chemicals used by students in laboratory practice, which are furnished at wholesale prices, and amount to but a small sum.

Furnishing an absolutely free education is as much as can be reasonably asked; and the Institution neither boards, clothes, nor supplies the student with text-books. Boarding can be obtained in private families at from $2.75 to $4 per week. Washing costs from seventy-five cents to one dollar per dozen. Text-books, which can be procured in Manhattan, cost from $2 to $5 per term.

No student need expend over $5 per week; and many of our best pupils are living at $1.25 per week. Students desiring to "board themselves" can do so at from $1 to $2 per week. In a club of four young men, renting a house, the average cost to each for the term was $1.11 per week.

LABOR.

Manual labor by the students may be for either of two purposes: First, to acquire skill in a given art; second, to earn money. In the first case, the labor is educational; in the second, it should be paid for by the party benefited.

Educational Labor.—Manual labor in the reciations of the Industrial Departments, like mental labor in those of the Literary Departments, is purely educational and will not be remunerated. While the interest of the student will be held paramount in the direction of this labor, the practice necessary to dexterity will be required.

Remunerated Labor.—When the Institution needs labor on the Farm or elsewhere which is not educational, but simply for its own profit, and which a student is able and willing to perform, it becomes an employer instead of a teacher, and he an employe instead of a scholar. It pays for work, he works for pay. The relation between them is commercial, not educational; and both parties must act upon business principles. Hence, the College furnishes only such employment as its own interests require, and will pay according to the value of the service rendered at from seven to ten cents an hour.

AMOUNT EARNED.

It is impossible to predict how much a given person can earn, since that depends upon what he can do and what work there is to be done. Hence, it is wholly impossible for us to answer the question so often asked: "Do you think I can meet my expenses by work?" Some students make one-half their expenses, some the whole, and exceptional men have made more than expenses. As a rule, a faithful boy skilled in farm work can earn half his expenses on the Farm or in the Nursery. During the year he can ordinarily acquire sufficient skill in the wood or iron shops to enable him to make articles for sale. The whole question is one for his own consideration and decision. We can teach all who come, but cannot absolutely *promise* anything more. Hitherto we have refrained from holding out strong inducements respecting the amount of labor we might have to offer; but in view of the fact that during each of the last three years we have had more to do than the students could perform, we are inclined to give greater and positive encouragement on this point. Any boy who is in dead earnest, who is familiar with farm operations, and who can raise $50 to start with, should be able to carry himself through the four years' course. And certainly this places an education within the reach of every determined boy. As yet we are unable to offer similar advantages to girls, not requiring labor in the College departments which they can perform.

RULES.

1. Behave as a true man or woman should, at all times and in all places.

2. Attend to your own business promptly, thoroughly and courteously; and vigorously let alone that of other people.

3. Penalty: "Leave!"

PUBLICATIONS.

The "Hand-Book," published in 1874, containing a full discussion of the educational question and the aims of the Institution, will be forwarded to any one desiring it.

THE INDUSTRIALIST, a weekly journal edited by the Faculty and published by the Printing Department, contains original and seasonable articles on the Farm, Orchard, Trades, Sciences, and Education. Price, 75 cents a year. Address A. A. Stewart, Manhattan.

CALENDAR.

Fall Term, 1879.—Will begin Wednesday, September 10th, 1879, and close December 18th, 1879.

TO NEW STUDENTS.

Bring the text-books you have been using. On arrival, first arrange for your boarding. A. A. Stewart will furnish information, either by letter or on application, concerning boarding places or rooms for rent. Report to the President at 8:30 A. M., immediately after chapel exercises, for enrollment.

For further information apply to Jno. A. Anderson, President, Manhattan, Kansas.

MARRIED.

FAILYER—POUND—At the residence of the bride's mother on College Hill, Wednesday, July 23d, 1879, by Rev. J. S. Griffing, PROF. GEORGE H. FAILYER, of the State Agricultural College, and MISS BELLE B. POUND.

The INDUSTRIALIST extends its heartiest congratulations to the subjects of the above notice. May their future prove as bright as the present. May their path be strewn with happiness. May the blessings of life be showered abundantly upon them.

RAILROAD TIME-TABLE.

KANSAS PACIFIC RAILWAY.

PASSENGER ARRIVES.

No. 2, going East	11:58 A. M.
No. 4, going East	3:28 A. M.
No. 1, going West	4:03 P. M.
No. 3, going West	4:51 A. M.
No. 7 (freight), going West	8:45 A. M.

Nos. 1, 2 and 7 run daily. No. 3 runs daily except Monday. No. 4 runs daily except Sunday. Passengers with tickets are carried on No. 7.

GEO. C. WILDER, Agent.

Berkshires.—A few very good ones of the choicest breeding now ready for shipment. Address E. M. Shelton, Manhattan, Kansas.

Short-horns of both sexes for sale at the College farm. One young bull, a very superior animal, may be had at a moderate price. Address E. M. Shelton, Manhattan, Kansas.

Clothier.—Wm. Knostman, dealer in Ready Made Clothing, Hats, Caps, and Gents' Furnishing Goods. A well selected winter stock on hand. Opposite post-office, Manhattan. 11-26

Bookseller and Stationer.—S. M. Fox, dealer in Fine Stationery, Pocket-Books Envelopes, Gold Pens, Blank Books, etc. No. 127 Poyntz Avenue, Manhattan. 19-3m

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Gardening for Profit.—Instruction and drill in Kansas Horticulture. The Nursery, Orchard, Vineyard, Vegetable Gardening, Flower and Landscape Gardening, and Kansas Forestry.

English Language.—The direct aim of the course is to make the student skillful in handling the machinery called language, just as an engineer handles his locomotive. Drill in English, History of English, Structure of English, Study of Words, and Rhetoric. Constant practice in the class room and, if desired, at the printer's cases.

Habits of Plants.—Thorough instruction in Vegetable Physiology; tracing the development of the root, stem, bud, leaf, flower and seed. Careful study of cereal grains, grasses, and other food-plants, and of native and foreign weeds. Special attention paid to the habits and best methods of preventing or destroying insects inimical to the Kansas Farmer.

Manhattan Bank.—E. B. Purcell, Banker; Jno. W. Webb, Cashier. A general banking business transacted. Bills of Exchange is sued on all principal cities and towns of Europe. All collections have the personal, faithful and prompt attention of our attorney. Proceeds remitted promptly, at current rates of exchange, without any charge of commission.

Instrumental Music.—Instruction in instrumental music will be given in private lessons as formerly, and also in classes. The classes will be drilled after school hours, or at such times as are convenient to students. The number of students in each class, on piano or organ, is limited to three. Instruction will also be given on the various brass and orchestral instruments. Harmony, composition and instrumentation will be taught. For terms, see heading "Expenses" in article entitled, "Directions to Applicants."

THE INDUSTRIALIST.

SATURDAY, JULY 26, 1879.

Industrial Education.

The real value of an education to the student depends upon two things: First, the practical worth of the knowledge taught; and, second, the degree in which he makes it his own. Hence, the ability of any institution to give a practical education depends upon the kind and aim of the knowledge it teaches, and upon the thoroughness of the instruction therein. The State Agricultural College was directly endowed by Congress, and is guided by the State, for the specific purpose of furnishing to the industrial classes of Kansas a "practical" education, that is, "one fit for use." As its name indicates, and as the statistics of the industries of the State require, its chief work must be that of giving a useful and usable education to those who will engage in farming; and, therefore, the Farmer's Course must, from the nature of the case, be its main one.

FARMER'S EDUCATION.

Words and figures are merely instruments with which to record ideas. They are not themselves ideas, nor should they be made the chief end of an education. As a wagon is necessary to haul grain, so are they a necessary part of an education; but as the wagon is not the grain, so they are not the knowledge which the farmer converts into money. Hence, the classics and higher mathematics are not taught. But it will be noticed in the following course that so soon as the pupil acquires working skill in the use of the English language as a tool, and of figures and lines as mathematical tools, those arts and sciences which present knowledge that has a cash value to the farmer are taught as rapidly as their importance and thorough acquisition will permit. Studies numbered (1) and (4) in the second, third and fourth years are the spine of the course, to which the others are as ribs and muscle.

FARMER'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Practical Agriculture (advanced.)		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	
3. Polit. Economy, Practical Law.		3. Practical Geometry.		3. Algebra.		3. Industrial Drawing.	
4. Zoology.		4. Horticul., Landscape Gardening.		4. Practical Agricul. (elementary).		4. English Structure.	
5. Agricul. Chemistry	Meteorology.	5. Organic, Analytical Chemistry.		5. Physics.		5. Adv'd Arithmetic, Book-keeping.	
6. Logic.		6. Practical Surveying.		6. Industrial Drawing.		6. U.S. History, Industrial Drawing.	

WOMAN'S EDUCATION.

Nearly one-half of our students are females, and the Woman's Course is prepared expressly for their liberal and practical education. We have no doubt whatever that practical men and women, who understand what it means and what it seeks to do, will fully endorse it.

WOMAN'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Farm Economy, Special Hygiene.		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	
3. Polit'l Economy, Practical Law.		3. Industrial Drawing.		3. Algebra.		3. Industrial Drawing.	
4. Zoology.		4. Horticul., Landscape Gardening.		4. English Literature.		4. English Structure.	
5. Phys'c'l Geography, Meteorology.		5. Organic, Household Chemistry.		5. Physics.		5. Adv'd Arith., Book-keeping.	
6. Logic.		6. Household Economy.		6. Industrial Drawing.		6. U.S. History, Industrial Drawing.	

MECHANIC'S EDUCATION.

Because of the adaptedness of the leading course to the wants of the intelligent mechanic, it has been found practically unnecessary to diverge from the Farmer's Course. Additional studies, specially adapted to the mechanic's use, will be furnished in a Post-Graduate's Course.

If it be urged that the distinctively agricultural knowledge taught in the Farmer's Course is not directly valuable to the mechanic, we reply that, admitting the point for the purpose of argument, yet: 1. This knowledge is of more practical value to the mechanic than is the Latin, Greek, or a half dozen other things embraced in the usual course preparatory to the professions; 2. That the great majority of Kansas mechanics will also be more or less engaged in agriculture; 3. That those studies in the course which are directly valuable to the mechanic, together with the shop facilities, offer a better mechanic's education than can be elsewhere found west of the Alleghanies.

INDUSTRIAL DEPARTMENTS.

Having knowledge in the head is one thing; ability to use it with the tongue, fingers or feet is quite another thing. Both are vital to success in practical life. A man might thoroughly understand the theoretical principles of carpentry, and yet, not having used the tools, be wholly unable to earn carpenter's wages. So in all other vocations. Accordingly, instruction is given in the following well-equipped Industrial Departments, and every student is required to recite in some one of them, as selected by the pupil or parent:

FOR MALE STUDENTS.	FOR FEMALE STUDENTS.
The Farm.	Dress-making.
The Nursery.	Printing.
Carpentry.	Telegraphy.
Cabinet-making.	Scroll-sawing.
Turning.	Carving.
Wagon-making.	Engraving.
Painting.	Photography.
Blacksmithing.	Instrumental Music.

Each of these departments is conducted exactly as in daily life, and aims to give precisely the drill received by an apprentice. No charge is made, either for tuition or material, from male students taking the Industrials provided for them; nor from female students taking the ones provided for them, except in Instrumental Music. Male students taking either Printing or Telegraphy are charged $1.00 per month for the use of instruments and material.

DEPARTMENTS OF INSTRUCTION.

DEPARTMENT OF AGRICULTURE.

PRACTICAL AGRICULTURE.

Second Year:—General principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage.

Fourth Year: General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of a rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farmhouses; barns.

FARM ECONOMY.

Woman's Course, Fourth Year: Dairy products as human food; influences affecting character of milk; manufacture of condensed milk; the factory system and household plan of cheese-making; treatment of rennet; general process of cheese manufacture; subsequent treatment of cheese; butter-making; creameries; "deep" and "shallow" setting systems; general process of butter-making; packing and preserving butter.

DEPARTMENT OF BOTANY AND PRACTICAL HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest; also a course of lectures on Landscape Gardening. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard; fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture; shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in in the work of laying out and plotting grounds topographically.

CHEMICAL DEPARTMENT.

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life. Text-book, Ganot.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blowpipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

Are constantly in progress in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

DRILL IN ENGLISH.

"As grammar was made after language, so ought it to be taught after language."—*Herbert Spencer.*

Drill in English embraces the following topics:

Sounds of the language; drill in producing the vocal, sub-vocal and aspirate elements with accuracy, distinctness and volume; vowels, consonants.

Letters: Form; power; rules for spelling, drill.

Words: Signification, properties, modifications, variations, relation and dependence.

Sentences: Drill in statement of ideas; description, clearness, terseness, vigor; business letters, discussion; capitalization; syllabication; punctuation; construction and analysis of sentences; elements, uses and names; criticism of compositions printed as written; proof reading; grammatical construction; superfluous words and clauses; drill in reading, speaking and penmanship.

Text-books: Webster's Academic Dictionary; Lee & Hadley's Advanced Lessons in Language.

Pupils deficient in spelling, etc., should enter the printing class, the printing-office being the work-shop of language.

STRUCTURE OF ENGLISH.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

MATHEMATICAL DEPARTMENT.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

DRILL IN ARITHMETIC.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Following this line, the student, so far from hammering away at "pure" science draws from the mathematical store-house what he needs, and sees why he needs it. Accuracy of calculation and posting, rather than a *mere* comprehension of the principles, is aimed at. Besides the recitation-room drill in business forms, practice in the field is also given. Estimating the number of cords in a pile of wood said to be 100x4x4 feet is one thing; measuring a pile of wood through which any number of cats may be harmlessly thrown, and in which four-feet sticks are the exception, is quite another and more difficult thing.

ARITHMETIC AND BOOK-KEEPING

Is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides ensuring arithmetical practice, develops practical skill in that important art.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admiral system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study. In addition, constant practice in the application of lines to metal and wood is furnished in the Blacksmith, Carpenter, Turning, Scroll-sawing, Carving, Engraving and Printing shops, and to fabrics in the Sewing Department.

PRACTICAL GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the use of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

PRACTICAL SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

STUDIES SPECIAL TO WOMAN.

Besides the studies already indicated, attention is called to the following:

SPECIAL HYGIENE.

As shown in the course, one term is devoted to the study of Physiology, from the text-book of Dr. J. C. Dalton. This is followed in the fourth year by a course of lectures to young ladies by Mrs. Cripps on the subject of Hygiene, embracing such instruction in hygienic matters as are valuable to woman.

FARM ECONOMY considers those affairs of the farm which usually come under the supervision of the farmer's wife or daughter, and which are not included in "gardening" or "household economy;" such as butter and cheese-making, dairy management, etc. A course of lectures is delivered by the Professor of Practical Agriculture. See heading, "Farm Economy."

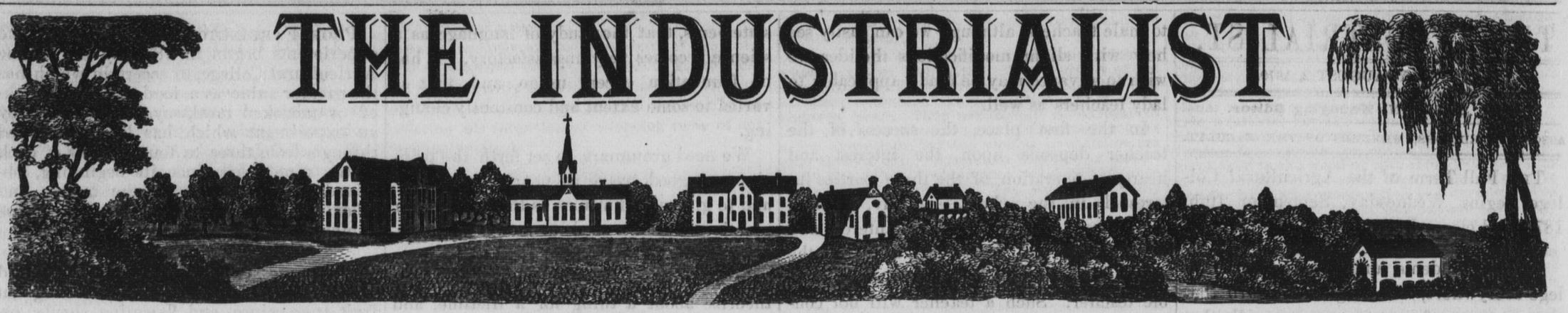
GARDENING is included in Practical Horticulture. See heading, "Landscape Gardening."

HOUSEHOLD CHEMISTRY. See heading, "Household Chemistry."

HOUSEHOLD ECONOMY

Follows Household Chemistry and consists of lectures by Mrs. Cripps on the art of house-keeping, embracing cookery, domestic management, and kindred topics. Many elderly gentlemen sufficiently know, and more young gentlemen will duly discover, that systematic knowledge of how cooking ought to be done is luminously different from the ability to do it. Instruction without practice can effect but little. Accordingly, a kitchen laboratory has been completely furnished, and affords every facility for drill in the art of cooking. This drill chiefly differs from that of a kitchen in the respect that after a girl has learned to wash dishes or pare potatoes she is not kept everlastingly at either. After full trial, we have found it just as feasible to give this practice, with profit and pleasure to the pupil, as it is to give laboratory practice in chemistry,—and no more expensive.

Printing!—Daily instruction and drill in the work of a First-Class Printer. The Literary Departments offer a thorough education in the construction and use of the English Language, as employed by the Proof-Reader; in Book-Keeping; and in Industrial Drawing, as the best developer of that taste necessarily exercised by every good Job Printer. The Printing Department is well furnished with all the facilities for a speedy mastery of the art of Printing, and is in charge of a practical printer. Besides regular class instruction in printing, the weekly publication of the INDUSTRIALIST by the Department furnishes advanced students the requisite drill in newspaper work.



THE INDUSTRIALIST

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THE INDUSTRIALIST.

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Address A. A. STEWART, Manhattan, Kas.

"What Shall I Do?"—A Young Man's Dilemma.

A very suggestive letter of inquiry has reached me from an Iowa youth of nineteen years, who states that he has "finished his education" without any special purpose or plans for the future, and with no particular bias for any "trade or profession;" but he wants to have a business proposed to him that he will be "*sure* to make something at," and he queries as to whether farming will pay as well as some city employment. This is a representative young man of these times. He probably means by saying he has finished his education that he has been to school and acquired enough of the knowledge given there to qualify him to study a profession; or, to state it in another way, he has just acquired the use of tools that will enable him to begin his education for the real business of life. Quite likely he has more knowledge given by schools than fell to the lot of several of our most successful men. Washington, Jackson, Lincoln, each began life's work with but little of the training of schools; but each of them found out, probably without asking much advice, "what to do."

The letter before me certainly suggests the thought that its writer lacks purpose and that energy of will which conquers obstacles. He appears to think that success is inherent in some branches of business. Now, it is not the business, so much as the man who conducts it, that achieves success. Men fail, and other men succeed, at precisely the same occupation, who live side by side. This is true not only of priests, lawyers and doctors, but it is the rule with every branch of business. The two village blacksmiths furnish a striking example. One soon became the owner of a home, paid for from the earnings of his hands. The shop that was built with a view of shoeing horses and doing like job work is soon enlarged, and in time expands into a machine shop, or perhaps a carriage factory. Wealth and respectability follow; skill, industry, self-denial, economy and unconquerable will do the work. The other man who commenced at the same time lacked some of these qualities, and has therefore drifted along, and at the end is no better off than when he began.

As to the choice of a business for life, no man can tell another as well as he can tell himself what to undertake; but one thing may be said, as applicable to all business,—first learn by serving under some skilled master, if it be possible, the best methods of conducting it; be an apprentice before attempting to be a master. The State of Iowa, where our young friend lives, has in it the promise of a great future; soil, climate and position are all in its favor; its farmers will be successful, and they will make all other classes successful. But this is generalizing, and will only be true of the industrious and wise people. There will be drones and unfortunates there as well as elsewhere, but in much less proportion than in cities; and, as a class, the farmers there will enjoy more of life and the rewards of industry than men who seek sudden wealth in towns. But each calling in life has its good and bad things, and the distribution is much more equal all around than men are apt to think. The great inequality in the prospects of success is to be found in the man himself.—*Hon. Geo. Geddes, in New York Tribune.*

DURING the thirteenth century the wages of farm hands in England was fifty cents per week. In the next century they had advanced fifteen cents, and continued to advance slowly until in the last century they had reached $1.87. The average for farm labor in the same countries now is $3.80 per week.—*Exchangs.*

Slurs on Women.

Of all evils prevalent among young men, we know of none more blighting in its moral effects than to speak lightly of the virtues of women. Nor is there anything in which young men are so thoroughly mistaken as in the low estimate they form as to the integrity of women,—not of their own mothers and sisters, but of others who, they forget, are somebody else's mothers and sisters. As a rule, no person who surrenders to this debasing habit is to be trusted with an enterprise requiring integrity of character. Plain words should be spoken on this point, for the evil is a general one and deep rooted. If young men are sometimes thrown into the society of thoughtless or depraved women, they have no more right to measure all other women by what they see of these, than they have to estimate the character of honorable and respectable citizens by the development of crime in our police courts. Let our young men remember that their chief happiness in life depends upon their utter faith in women. No worldly wisdom, no misanthropic philosophy, no generalization, can cover or weaken truth. It stands like the record of itself,—for it is nothing less than this,—and should put an everlasting seal upon lips that are wont to speak slightingly of women.—*Rural New-Yorker.*

A Word to the Farmers.

The casual observer could not fail to note, as the season has advanced, the great difference in the growth of the crops on adjoining farms, sometimes in adjoining fields. Closer observation will have shown the reason for these differences. Wherever we have found the best crops—a good stand, rank growth, and full yield,—inquiry has developed that the plowing has been done with a strong team and to a good depth, occasionally as much as eight or nine inches, though the average is scarcely more than seven inches. Again, we have generally found that the same judgment which dictated the deep plowing has also prompted thorough pulverizing. We have yet to see a field where these two conditions have been complied with that has not yielded a fine crop of wheat, or has not a strong and promising growth of corn upon it. It is not only the dictate of a sound theory and good common sense that these conditions are particularly necessary in a soil like this, where rain falls at intervals and the chief dependence for moisture is in the supply absorbed by the subsoil, but experience is proving it to be an imperative necessity. Wherever you find shallow plowing, only three or four inches stirred, and that not thoroughly pulverized, you will find it destitute of moisture and a very poor receptacle for plant roots.—*Anthony Journal.*

Buffalo Bones.

About ten years ago the present manager of the St. Louis Carbon Works was traveling across these plains on the old Santa Fe trail. He particularly noticed while journeying the immense amount of buffalo bones that covered the prairies. With a Yankee's ingenuity he bethought himself that these bones might be made of practical use. He knew that in sugar refineries bones were used which were brough from North and South Carolina, and put through a steaming process. He sent to Germany and brought to America a man who was at once a chemist and practical machinist. Between them they invented and patented machinery whereby the bones could be ground dry and rapidly, and thus retain all their different valuable properties. A company was at once organized and commenced grinding, its capacity is now from thirty to fifty tons a day, and a capital of at least a hundred thousand dollars is employed in carrying on the business. After the bones are unshipped they are picked over and assorted. Of the refuse the common fertilizing phosphates are made. The other bones are ground into bone-black, which is used exclusively for refining sugar.

Mr. Woodruff buys in Kansas alone about one thousand car loads a year. For years past these bones have been a Godsend to the settlers of Kansas, who have come here and have subsisted by picking bones while waiting for the growth of their crops. Many a farmer has been literally saved from starvation by this gift of nature,—these useless looking bones. Mr. Woodruff is the only man who follows exactly his line of business in the United States. He is a gentleman of wide and varied experience, and we are sure he would take pleasure in imparting any information which anybody made curious by this short sketch might desire. —*Larned Chronoscope.*

THE recent act of the Kansas Legislature, on the school-book question, cuts off competition by giving already-established publishing houses a grip upon the purses of the people for a period of five consecutive years. At least this is the gist of the Attorney General's "opinion." Within six months after the passage of the act, school boards are to adopt a uniform series in each branch of study; and this action cannot be changed for a period of five years, except by a petition of four-fifths—a majority or even two-thirds will not do—of the resident voters of the district. We had a reasonable prospect of the establishment of a Kansas Publishing House; but the law, if mandatory, which is a disputed question, effectually squelches home competition. If such a house were to get out a superior series of school books, both in matter, arrangement and mechanical execution, and offer them at half the prices now charged by the Monopoly, the five-year grip given to the extortioners would prevent the people from keeping their money within the State and compel them to send it abroad—unless boards of education in their discretion might see proper to make a change upon a four-fifths petition.—*Abilene Gazette.*

Our Exchanges.

H. W. Johnson captured a tarantula last Sunday morning, carrying on its back about a dozen young ones. It was a villainous looking insect, but not so large as the native of Texas.—*Kinsley Graphic.*

During the last fourteen years the people of Kansas have broken up and put under cultivation two million acres of prairie land, and have built over three thousand miles of railroad.—*Madison News.*

Advices from all parts of the country indicate that this year's crop of corn will be the largest ever harvested in Kansas, and that the surplus will be something remarkable. Kansas can feed the world in her good years, and of late every year has been a good one.—*Leavenworth Times.*

From El Paso, on the Rio Grande, to Guaymas, on the Gulf of California, is four hundred miles. Get the map and notice the location of each, and you will see where Kansas produce will eventually go to reach the seaboard. The principal owners of the A., T. & S. F. have formed "The Senora Company," for the purpose of building this four hundred miles of road, and have received a grant of 15,000 acres of land from the Mexican government. The main line of the Santa Fe will be pushed to El Paso, to connect with the Senora line. Guaymas will become a lively rival to San Francisco. —*Nickerson Argosy.*

THE next College term begins Sept. 10th.

THE INDUSTRIALIST.

SATURDAY, AUGUST 2, 1879.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

THE Fall Term of the Agricultural College begins Wednesday, September 10th, 1879, and closes December 18th, 1879.

OUR old students, and friends of the College everywhere, will be glad to learn that the prospects for next term are all that could be desired. Every mail brings a shower of inquiries from those intending to become students; and, to judge from present indications, we shall commence next term with nearly or quite double the usual number of students.

THE following is the provision of the law in regard to the election of township school officers: "An annual meeting of each school district shall be held on the second Thursday in August of each year, at the schoolhouse belonging to the school district, at two o'clock P. M." For this once, Messrs. Tax-payers, resign the plow and mower, and for one hour let the children's interests have your undivided attention. Or, should the meeting be captured by those interested only in reducing taxes, and your school be thus strangled in advance, eternally hold your peace!

WE acknowledge the receipt of the catalogues of several industrial institutions. We propose to give the readers of the INDUSTRIALIST brief notices of some of the most successful.

The Worcester Free Institute was founded by the benefaction of two citizens of Worcester, Mass., "who had a conviction that there is need of a system of training boys for the duties of an active life, which is broader and brighter than the popular method of learning a trade, and more simple and direct than the so-called liberal education." It was opened for the reception of students in 1868. Eight classes have graduated, numbering in the aggregate, 168. Nearly all the graduates are engaged in industrial pursuits. "The ease with which the graduates of the Institute have secured honorable and lucrative situations confirms the trustees in the soundness of the general principles upon which the school is organized and carried on."

The Worcester Free Institute "offers a good education — based on the mathematics, living languages, physical sciences, and drawing,— and sufficient practical familiarity with some branch of applied science to secure to its graduates a livelihood." Three years are required to complete the course of study. The tuition is free to the residents of Worcester county; to others, $100 per year.

Compared with the Kansas State Agricultural College, the Worcester Free Institute is a private institution. Its privileges are free only to the youth of a single county, and its course of study and training prepare young men only for machinists and engineers. As an institution of its kind, it stands among the first. The Board of Instruction numbers ten; the catalogue shows an attendance of ninety.—*Prof. Ward.*

The Teachers and the Farmers.

At this season, when teachers' institutes are being held in many different localities in the State, it seems not inappropriate to offer a few suggestions to the gentlemen who, during the coming winter, will guide the minds of a large proportion of the youth of the State. We say gentlemen because what we have to say will apply more especially to male teachers, although we can easily see how with slight modifications the idea we wish to advance may be made applicable to lady teachers as well.

In the first place, the success of the teacher depends upon the interest and hearty co-operation of the three parties interested in the school,— namely, teacher, pupils and parents. But this interest and co-operation will rarely fail to attend the efforts of every really enthusiastic and capable teacher. Such a teacher will not consider his duties to have ended when the mere routine work of the school is done. He will constantly bear in mind the future of his pupils; and if he is wise he will not mistake the practical tendencies of the age, but will so direct his teaching that the instruction given will be of greatest service to the pupil as a citizen and a wealth producer.

It can hardly have escaped the mind of every thoughtful teacher of the country schools, that a very large majority of the pupils of these schools will in after life be supported by their labor directed on the farm. And it seems to us that in these district schools at least, a "new departure" from the ordinary book studies might be taken, which, if carried out in the proper spirit, would be of undoubted benefit to the agricultural public. Is it not of as much importance to know how to raise a crib of corn as to be able to measure the contents of the crib? We would have every teacher give instruction in agriculture or agricultural science to those capable of receiving it. Let a certain fixed portion of each week be devoted to the discussion of topics intimately connected with farm life. This may be done by lectures, or by the reading of newspaper articles; but in every case let the effort be made to "draw out" the student, as well as to enlighten him. The great effect of this instruction would be to awaken in the minds of the pupils a thoughtful interest in agriculture. They would see at once that agriculture involves something more than mere manual labor; and during the long summers the labors of the farm would constantly furnish themes for thought and investigation to these active minds.

In another way the teacher might be an instrument for great good to the community which pays his salary. Near almost every school district in the land are to be found granges, farmers' clubs, or other farmers' organizations. Let the teacher at once identify himself with one of these organizations. He can easily suggest topics for discussion, or lead off when the interest flags with short addresses or lectures upon scientific or agricultural subjects. In this way, the teacher's knowledge supplementing the farmer's experience, great good must result; and the teacher will soon realize, if he has not before, what a useful and a pleasant life a teacher's may be. Moreover, we are quite confident that this teacher will rapidly get at the top of the market, so far as salary goes; and if he wishes, he can keep his school for a second or even a "third term." —*Prof. Shelton.*

Teaching English.

A great amount of time is spent in our common schools in going through the dry routine of parsing. It is so uninteresting to most young persons that we often hear the remark, "I always disliked grammar." Now, it is true that our children, in the main, derive as little real profit from the exercise as they do enjoyment. Language is not an exact science, and an attempt to bring everything down to a square rule must be futile. Those who have attempted to do so differ so widely in some of their statements, that the study of language as a science becomes very unsatisfactory. It has no foundation except usage, and that is varied to some extent and constantly changing.

We need grammars to set forth the principles of good usage as nearly as may be, and to give us definitions as the basis of our practice; but we need to study language, not so much to understand its theories as to gain skill in the use of it. A man may theorize about a thing for a lifetime, and yet acquire very little skill in the practical use of it; and so our boys and girls may recite the rules of our grammars and parse the words according to some prescribed formula, and yet have very few thoughts and very little facility in expressing them upon any subject that may be presented. Now, this latter object is the thing desired; and how it shall best be obtained is the question which the thoughtful teacher should keep in mind. I venture a few suggestions.

Let a standard treatise (from some creditable author) on grammar, or more than one, be placed in the hands of each pupil, from which to learn important definitions. A student should know the difference between an adjective and an adverbial element, he should know when to use the nominative pronoun and when the objective, and the like; but let the principal use of the grammar be as a book of reference, to decide unknown or disputed points in practice, and let the chief portion of the time occupied in the study be spent in the written expression of thought and in a criticism of the same. This can be done in a great variety of ways, and in a manner which is rather pleasing to the pupils instead of irksome. Let any familiar object, such as a peice of glass, an ear of corn, or a lamp, be placed before them, and they requested to write the thoughts suggested to them by that object. Or, let a picture be shown them, with the request to write what they see in the picture and what their thoughts are about it. As they acquire ease and accuracy in expressing their thoughts about familiar objects, pass to descriptive or abstract themes which are quite within their capacity, or at least such as they have the opportunity to learn about, never giving subjects beyond the depth of the pupil, as this always tends to discourage them. Let each written exercise be carefully criticised, first by each pupil criticising the exercise of his neighbor, then the teacher reviewing as many as practicable; and in the criticism let the text-book be brought largely into use, showing the reason for the correction. In this way, in my judgment, far better than in confining the class to abstract principles, can the object aimed at — skill in the use of language — be attained; and it certainly is a road far more agreeable for the pupil to travel than the other. It is really getting at things right end foremost.

I might add that a study of words, similar to the plan adopted in "Swinton's Word Analysis," giving root-words with their prefixes and suffixes, and the shade of meaning of each, also the common Latin and Greek roots with the words derived from each, is a great assistance to the pupil, in aiding him to really comprehend the meaning of words, and also giving him greater variety of expression.—*Prof. Platt.*

RETURNS from all parts of Kansas show that while the wheat yield may possibly not be so large this year as last, the quality is better, and the value to the farmer will be greater. The corn crop of the State for this year will be literally immense, and all other crops will turn out much better than was anticipated early in the season.

PROF. FARRINGTON, in a summary of the experiments begun in 1870 by the Maine Agricultural College, to ascertain which has the greater value as a food for swine, cooked or uncooked meal, says: "We have, by an experiment which has been continued through from three to four months of each of the nine years since its beginning, obtained evidence that all the money and labor expended in cooking meal for swine is more than thrown away."—*Exchange.*

IF young farmers, beginning married life, would pay due attention to setting out fruit trees, vines, and flowering shrubs, ornamenting their door-yards, dividing their places into convenient fields by good fences or hedges, arranging their gardens, poultry houses, out-houses, etc., etc., to the best advantage, with a view to appearances, they would realize for their pains real pleasure and substantial profit. Such matters are positive elements of gradual culture which tend to refinement, influencing the whole family for good so long as the system thus begun may be pursued.—*Exchange.*

ON June 30th, 1879, the close of the fiscal year, the number of inmates in the Kansas Penitentiary was 620; an increase during the fiscal year of 120.

THE INDUSTRIALIST.

SATURDAY, AUGUST 2, 1879.

Instead of the usual circular or catalogue, we send the Industrialist to those desiring information about the Kansas State Agricultural College. We would call attention to the articles headed "Departments of Instruction," "Industrial Education," "Special Advantages," and "Directions to Applicants." If further information is desired, address Agricultural College, Manhattan, Kansas.

SPECIAL NOTICES.

Those intending to take boarders next term, or who have rooms to rent, either furnished or unfurnished, are requested to notify Prof. Ward or A. A. Stewart of the fact.

The old Boarding Hall has been rented to Mr. Viles, who has contracted to furnish gentlemen students plain, table board at $1.50 per week. Unfurnished rooms, accommodating from two to four persons, at $1.50 a room per month. Those desiring to board themselves can obtain rooms in the old College building.

We have frequent applications, from young ladies and gentlemen in distant parts of the State, for situations in families, where they can pay their board, in whole or in part, by work, while attending College. Families in town, or in the immediate vicinity, desiring such help, are requested to communicate with Prof. Ward.

District boards about to issue school bonds are invited to correspond with us before negotiating elsewhere. We pay par for first-class 7 per cent bonds, issued upon our blanks. Bonds drawn on our blanks are not transferable, and hence may be safely sent by mail at letter postage. Blanks furnished free of charge on application to M. L. Ward, Loan Commissioner.

Harry Rushmore writes us that he has been sick with the fever. He is now better, however, and is working on his father's farm.

Mr. Favour, a student from Greenwood county, writes that a number from his locality talk of attending the College this fall.

W. C. Stewart has been absent from Manhattan since the 4th ult. He is traveling in the interest of the Bell Telephone Company.

Cattle do poorly the present season, although food and water are abundant and good. The flies are the great trouble, and we have never seen them worse.

The farm has just cut another good crop of hay from the patch of alfalfa growing on the lawn. This makes the third hay crop from this piece the present season.

A note from Prof. Failyer informs us that he is finding his sojourn among the mountains "full of pleasure and profit." He is now at Louisville, on the Colorado Central.

It is pretty generally believed that within a year Manhattan will have two more railroads. This fact is giving a new impetus to all kinds of business. So mote it be.

Prof. Ward informs us that during the last three weeks seventy-five persons have applied to him for information concerning the College. This is certainly a good indication.

There were five young men here one day this week to visit the College. They were from different parts of the State, and contemplate attending the Institution next term.

The Regents of this Institution will meet in Manhattan next Tuesday evening. Persons having business to transact with these gentlemen will govern themselves accordingly.

The colored people of this vicinity went down to Alma yesterday to celebrate Emancipation Day,—which is their 4th of July. The negro exodus to Kansas this year has caused more attention than usual to be given to the day.

S. C. Mason and sister have secured rooms in the McNair house west of the College, and now rejoice because they are to be so favorably located next term. Mr. Mason gave us the names of several persons whom he thinks will attend the College this year.

For tact, persistence, singleness of purpose, intrepidity of countenance, and all business virtues, commend us to that dipterous insect, the average Kansas fly. In his way he beats all creation, just as easily as the Kansas cyclones, big prairies, and 22-foot corn.

The farmers in this locality have commenced haying. Early in the summer the prospects for a good crop of grass were not very flattering, but the rains of the last two months have allayed all fears. There will be no difficulty in obtaining at a reasonable cost all the hay which can be handled.

Mr. Hawkes is the handiest man employed on these premises. Nearly every week he places the INDUSTRIALIST under obligations to him by his ingenuity and ability. Whenever our press gets out of order, or we want any kind of repairing done, we send for Hawkes, and he has never failed to give satisfaction.

We received a pleasant call last week from Prof Edwards, recently elected President of the Colorado Agricultural College. President E. critically and professionally examined our methods of keeping books, etc., etc.; and tickled our vanity by declaring his intention of adopting some of our "original methods."

We are much pleased with the performances of the piece of Golden millet seeded last spring. The growth is simply enormous. We judge that the yield of hay will be quite double that of ordinary millet and Hungarian under the same treatment. We have picked heads of Golden millet that measured over two inches in diameter.

We have been notified by Mrs. Gale, Mrs. Hosmer, Mrs. Donaldson, Mrs. Todd, and Mrs. Wahl, that they will take boarders next term. We mention these names for the benefit of those students who desire to make arrangements for their board before returning. Remember, also, the announcement in another column in regard to the old Boarding Hall.

ACKNOWLEDGMENTS.

Thomas C. Jones & Son, Delaware, Ohio. Supplemental list of Short-horn cattle.

Chauncey Hills, Delaware, Ohio. Catalogue of Crystal Spring Herd of Short-horn cattle.

National Base-ball Association. Constitution and playing rules for 1879. Official publication.

Enoch Marvin College, Oskaloosa, Kansas. First Annual Catalogue of the officers and students, 1878–9.

University of Kansas, Lawrence, Kansas. Thirteenth Annual Catalogue of officers and students, 1878–9.

Tippecanoe County Fair, LaFayette, Ind., to be held Sept. 1st to 6th, 1879. Premium list, rules and regulations. Cash premiums, $7,000.

Joseph Harris, Moreton Farm, Rochester, N. Y. Catalogue and price list of pure-bred Cotswold sheep, Cotswold-Merino sheep, and Essex pigs.

Shawnee County Agricultural Society. List of premiums for the Tenth Annual Fair, to be held at Topeka, Kas., Sept. 30th and Oct. 1st, 2d and 3d, 1879.

American Vegetable Fiber Company, Philadelphia. Important information in relation to improved method of treating flax, hemp, and other similar plants.

Illinois Wesleyan University, Bloomington, Ill. Twenty-second Annual Catalogue of the officers and students, for the collegiate year ending June 19th, 1879. Kindly sent us by Prof. H. C. DeMotte, of the Faculty.

We also have to acknowledge the receipt of complimentary tickets to the Seventh Annual Exhibition of the S. R. V. A. H. M. & S. A., to be held at Baxter Springs, Kansas, Oct. 1st, 2d and 3d; and to the Tenth Annual Fair of the Shawnee County Agricultural Society, referred to above.

NATIONALIST ITEMS.

Mr. George Gale and wife came down from Milford last week.

B. F. Griffin has millet heads raised on his place that measure fifteen inches in length.

Corn has been coming into town quite lively of late. The big elevator has been full for some days.

The section men belonging here laid three car loads of steel rails last Saturday. Pretty good day's job.

There will be an examination of applicants for county certificates at the new school building in Manhattan, on Friday and Saturday, August 8th and 9th.

Every friend of temperance who can do so ought to attend the temperance camp-meeting at Bismarck Grove, which commences August 14th and continues to the 26th.

The tax list in this county never was large, but this year it is smaller than usual. There is less land advertised than in any of the older counties in the State. This demonstrates that the county is comparatively prosperous.

Mr. Smeed, chief engineer of the K. P. Railroad, was in town Wednesday with a surveying party, and informed us that he intended to commence at once to survey a line for a branch of that road from Manhattan to Marysville, in Marshall county.

SPECIAL ADVANTAGES.

We enumerate a few of the special advantages which the Agricultural College presents to the young people of the State of Kansas:

First: Although an industrial school, as thorough and as complete an education—using the term in its popular sense—can be acquired here as in other schools. A student will make as rapid advancement here as elsewhere in the studies pursued, whether he remains here one or two years, or through the whole course.

Second: While obtaining a knowledge of English, mathematics, and the natural sciences, every student is learning some useful trade or art. This peculiar feature of the Agricultural College is a success. It should no longer be regarded as an experiment. Those who have been here one, two or three years are now in good positions, receiving good wages as telegraph operators, printers, carpenters, etc. Young men who have been through the course in practical agriculture and horticulture are rapidly becoming known as the best farmers in the localities in which they reside.

Third: The expenses are brought down to the lowest possible point. There are no matriculation fees, no tuition bills, no college customs, which compel a useless expenditure for badges or dress. The expenses are simply the cost of living, and the text-books used.

Fourth: The high moral and religious influence which exists at Manhattan. The students of the Agricultural College are young men and women of excellent character. Their average age is about eighteen years. They are deeply in earnest in their efforts for advancement. Of course there are a few exceptions, but the vicious or shiftless are soon thrown out. "Attend to business or leave" is the one rule. A wholesome religious influence pervades the Institution. The students' weekly prayer-meeting has been well sustained for more than ten years.

DIRECTIONS TO APPLICANTS.

TERMS OF ADMISSION.

Candidates for admission must be fourteen years of age, and pass a satisfactory examination in reading; arithmetic, through decimal fractions; and English grammar, to syntax. Classes are started at the beginning of each year in Drill in Arithmetic and Drill in English; and the pupil must have the knowledge above indicated, else he will be unable to retain position if admitted.

Pupils will be received at any time during the year, if able to pass an additional examination upon the subjects studied by the classes which they expect to enter. But they will find it greatly to their advantage to be present at the opening of each term, or as soon thereafter as possible.

GRADES.

Both the Literary and Industrial recitations are graded daily upon a scale of 100; and an examination of all classes is made at the close of each month. A student not attaining an average grade of sixty is promptly dropped to a lower class, or excluded from the Institution until able to do so. The work of grading is strict and uniform in all the departments, and this process is rigorously used for sifting out incompetent and indolent pupils; thus more than accomplishing all that is designed to be effected by a "high standard of admission." Hence, the student's continuance in the College wholly depends upon his own action.

The course is based upon the determination to make the labor required in the preparation of one industrial and three literary recitations as much as the average student can perfectly perform, in ten hours a day. We design to give the pupil the worth of the time expended at College; and, in order thereto, he must do a full day's work with brain or hand. Only those students who can maintain a standing of ninety in each study will be allowed to take more than the prescribed number of recitations; and no one will be permitted to have less than one industrial and three literary recitations.

RELIGIOUS.

Unless otherwise directed by parents, students are required to attend chapel at 8:30 A. M. on academic days, and divine service once every Sabbath.

EXPENSES.

There are no charges whatever for enrollment, attendance or instruction in the regular courses; nor are there any "contingent fees" for the repair of buildings, for the use of books or apparatus, for diplomas, or the kindred privileges usually grouped under the term "contingent." Male students are furnished instruction, the use of apparatus, instruments or tools, in both the literary and industrial classes marked out for them, without any charge. And the same is true of female students in the regular classes provided for them. Printing and Telegraphy are industrials primarily provided for the education of female students, and male students taking either of these are charged $1 per month for use of instruments.

Instrumental music is a fine art or "accomplishment," rather than a mechanical art. We do not place it among our "industrials" in the same sense, or for the same purpose, that we do those provided for teaching the trades. Accordingly, the following fee is required from female students for tuition and the use of instruments:

Terms per week:

Private lessons, 2 a week, on any instrument, $1.00
Private lessons, 1 a week, on any instrument, .60
Class lessons, 2 a week, on any instrument, .65

Instruction in harmony, etc., etc., from ten to fifty cents per week, as the student may or may not be in other classes.

The only charge made for material in either the literary or industrial departments is for the chemicals used by students in laboratory practice, which are furnished at wholesale prices, and amount to but a small sum.

Furnishing an absolutely free education is as much as can be reasonably asked; and the Institution neither boards, clothes, nor supplies the student with text-books. Boarding can be obtained in private families at from $2.75 to $4 per week. Washing costs from seventy-five cents to one dollar per dozen. Text-books, which can be procured in Manhattan, cost from $2 to $5 per term.

No student need expend over $5 per week; and many of our best pupils are living at $1.25 per week. Students desiring to "board themselves" can do so at from $1 to $2 per week. In a club of four young men, renting a house, the average cost to each for the term was $1.11 per week.

LABOR.

Manual labor by the students may be for either of two purposes: First, to acquire skill in a given art; second, to earn money. In the first case, the labor is educational; in the second, it should be paid for by the party benefited.

Educational Labor.—Manual labor in the reciations of the Industrial Departments, like mental labor in those of the Literary Departments, is purely educational and will not be remunerated. While the interest of the student will be held paramount in the direction of this labor, the practice necessary to dexterity will be required.

Remunerated Labor.—When the Institution needs labor on the Farm or elsewhere which is not educational, but simply for its own profit, and which a student is able and willing to perform, it becomes an employer instead of a teacher, and he an employe instead of a scholar. It pays for work, he works for pay. The relation between them is commercial, not educational; and both parties must act upon business principles. Hence, the College furnishes only such employment as its own interests require, and will pay according to the value of the service rendered at from seven to ten cents an hour.

AMOUNT EARNED.

It is impossible to predict how much a given person can earn, since that depends upon what he can do and what work there is to be done. Hence, it is wholly impossible for us to answer the question so often asked: "Do you think I can meet my expenses by work?" Some students make one-half their expenses, some the whole, and exceptional men have made more than expenses. As a rule, a faithful boy skilled in farm work can earn half his expenses on the Farm or in the Nursery. During the year he can ordinarily acquire sufficient skill in the wood or iron shops to enable him to make articles for sale. The whole question is one for his own consideration and decision. We can teach all who come, but cannot absolutely *promise* anything more. Hitherto we have refrained from holding out strong inducements respecting the amount of labor we might have to offer; but in view of the fact that during each of the last three years we have had more to do than the students could perform, we are inclined to give greater and positive encouragement on this point. Any boy who is in dead earnest, who is familiar with farm operations, and who can raise $50 to start with, should be able to carry himself through the four years' course. And certainly this places an education within the reach of every determined boy. As yet we are unable to offer similar advantages to girls, not requiring labor in the College departments which they can perform.

RULES.

1. Behave as a true man or woman should, at all times and in all places.

2. Attend to your own business promptly, thoroughly and courteously; and vigorously let alone that of other people.

3. Penalty: "Leave!"

PUBLICATIONS.

The "Hand-Book," published in 1874, containing a full discussion of the educational question and the aims of the Institution, will be forwarded to any one desiring it.

THE INDUSTRIALIST, a weekly journal edited by the Faculty and published by the Printing Department, contains original and seasonable articles on the Farm, Orchard, Trades, Sciences, and Education. Price, 75 cents a year. Address A. A. Stewart, Manhattan.

CALENDAR.

Fall Term, 1879.—Will begin Wednesday, September 10th, 1879, and close December 18th, 1879.

TO NEW STUDENTS.

Bring the text-books you have been using. On arrival, first arrange for your boarding. A. A. Stewart will furnish information, either by letter or on application, concerning boarding places or rooms for rent. Report to the President at 8:30 A. M., immediately after chapel exercises, for enrollment.

For further information apply to Jno. A. Anderson, President, Manhattan, Kansas.

LITERARY SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in College building every Friday at 2 P. M. Ladies admitted. New students cordially invited to attend. GEORGE PERRY, President.
MISS GRACE PARKER, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Telegraph Hall every Saturday evening. Visitors, especially students, always welcome.
C. E. WOOD, President.
C. M. SHARTEL, Secretary.

RAILROAD TIME-TABLE.

KANSAS PACIFIC RAILWAY.

PASSENGER ARRIVES.

No. 2, going East..... 11:58 A. M.
No. 4, going East..... 3:28 A. M.
No. 1, going West..... 4:03 P. M.
No. 3, going West..... 4:51 A. M.
No. 7 (freight), going West..... 8:45 A. M.

Nos. 1, 2 and 7 run daily. No. 3 runs daily except Monday. No. 4 runs daily except Sunday. Passengers with tickets are carried on No. 7.
GEO. C. WILDER, Agent.

THE INDUSTRIALIST.

SATURDAY, AUGUST 2, 1879.

Industrial Education.

The real value of an education to the student depends upon two things: First, the practical worth of the knowledge taught; and, second, the degree in which he makes it his own. Hence, the ability of any institution to give a practical education depends upon the kind and aim of the knowledge it teaches, and upon the thoroughness of the instruction therein. The State Agricultural College was directly endowed by Congress, and is guided by the State, for the specific purpose of furnishing to the industrial classes of Kansas a "practical" education, that is, "one fit for use." As its name indicates, and as the statistics of the industries of the State require, its chief work must be that of giving a useful and usable education to those who will engage in farming; and, therefore, the Farmer's Course must, from the nature of the case, be its main one.

FARMER'S EDUCATION.

Words and figures are merely instruments with which to record ideas. They are not themselves ideas, nor should they be made the chief end of an education. As a wagon is necessary to haul grain, so are they a necessary part of an education; but as the wagon is not the grain, so they are not the knowledge which the farmer converts into money. Hence, the classics and higher mathematics are not taught. But it will be noticed in the following course that so soon as the pupil acquires working skill in the use of the English language as a tool, and of figures and lines as mathematical tools, those arts and sciences which present knowledge that has a cash value to the farmer are taught as rapidly as their importance and thorough acquisition will permit. Studies numbered (1) and (4) in the second, third and fourth years are the spine of the course, to which the others are as ribs and muscle.

FARMER'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Practical Agriculture (advanced.)	1. Practical Agriculture (advanced.)	1. Botany, Entomology.	1. Botany, Entomology.	1. Physiology.	1. Physiology.	1. Drill in English.	1. Drill in English.
2. Geology, Mineralogy.	2. Geology, Mineralogy.	2. Inorganic Chemistry.	2. Inorganic Chemistry.	2. Rhetoric.	2. Rhetoric.	2. Drill in Arithmetic.	2. Drill in Arithmetic.
3. Polit. Economy, Practical Law.	3. Polit. Economy, Practical Law.	3. Practical Geometry.	3. Practical Geometry.	3. Algebra.	3. Algebra.	3. Industrial Drawing.	3. Industrial Drawing.
4. Zoology.	4. Zoology.	4. Horticul., Landscape Gardening.	4. Horticul., Landscape Gardening.	4. English Literature.	4. English Structure.	4. English Structure.	4. English Structure.
5. Phys'c'l Geography, Meteorology.	5. Agricul. Chemistry Meteorology.	5. Organic, Analytical Chemistry.	5. Organic, Household Chemistry.	5. Physics.	5. Physics.	5. Adv'd Arithmetic, Book-keeping.	5. Adv'd Arithmetic, Book-keeping.
6. Logic.	6. Logic.	6. Practical Surveying.	6. Household Economy.	6. Industrial Drawing.	6. Industrial Drawing.	6. U.S. History, Industrial Drawing.	6. U.S. History, Industrial Drawing.

WOMAN'S EDUCATION.

Nearly one-half of our students are females, and the Woman's Course is prepared expressly for their liberal and practical education. We have no doubt whatever that practical men and women, who understand what it means and what it seeks to do, will fully endorse it.

WOMAN'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Farm Economy, Special Hygiene.	1. Farm Economy, Special Hygiene.	1. Botany, Entomology.	1. Botany, Entomology.	1. Physiology.	1. Physiology.	1. Drill in English.	1. Drill in English.
2. Geology, Mineralogy.	2. Geology, Mineralogy.	2. Inorganic Chemistry.	2. Inorganic Chemistry.	2. Rhetoric.	2. Rhetoric.	2. Drill in Arithmetic.	2. Drill in Arithmetic.
3. Polit'l Economy, Practical Law.	3. Polit'l Economy, Practical Law.	3. Industrial Drawing.	3. Industrial Drawing.	3. Algebra.	3. Algebra.	3. Industrial Drawing.	3. Industrial Drawing.
4. Zoology.	4. Zoology.	4. Horticul., Landscape Gardening.	4. Horticul., Landscape Gardening.	4. English Literature.	4. English Literature.	4. English Structure.	4. English Structure.
5. Phys'c'l Geography, Meteorology.	5. Phys'c'l Geography, Meteorology.	5. Organic, Household Chemistry.	5. Organic, Household Chemistry.	5. Physics.	5. Physics.	5. Adv'd Arith., Book-keeping.	5. Adv'd Arith., Book-keeping.
6. Logic.	6. Logic.	6. Household Economy.	6. Household Economy.	6. Industrial Drawing.	6. Industrial Drawing.	6. U.S. History, Industrial Drawing.	6. U.S. History, Industrial Drawing.

MECHANIC'S EDUCATION.

Because of the adaptedness of the leading course to the wants of the intelligent mechanic, it has been found practically unnecessary to diverge from the Farmer's Course. Additional studies, specially adapted to the mechanic's use, will be furnished in a Post-Graduate's Course.

If it be urged that the distinctively agricultural knowledge taught in the Farmer's Course is not directly valuable to the mechanic, we reply that, admitting the point for the purpose of argument, yet: 1. This knowledge is of more practical value to the mechanic than is the Latin, Greek, or a half dozen other things embraced in the usual course preparatory to the professions; 2. That the great majority of Kansas mechanics will also be more or less engaged in agriculture; 3. That those studies in the course which are directly valuable to the mechanic, together with the shop facilities, offer a better mechanic's education than can be elsewhere found west of the Alleghanies.

INDUSTRIAL DEPARTMENTS.

Having knowledge in the head is one thing; ability to use it with the tongue, fingers or feet is quite another thing. Both are vital to success in practical life. A man might thoroughly understand the theoretical principles of carpentry, and yet, not having used the tools, be wholly unable to earn carpenter's wages. So in all other vocations. Accordingly, instruction is given in the following well-equipped Industrial Departments, and every student is required to recite in some one of them, as selected by the pupil or parent:

FOR MALE STUDENTS.	FOR FEMALE STUDENTS.
The Farm.	Dress-making.
The Nursery.	Printing.
Carpentry.	Telegraphy.
Cabinet-making.	Scroll-sawing.
Turning.	Carving.
Wagon-making.	Engraving.
Painting.	Photography.
Blacksmithing.	Instrumental Music.

Each of these departments is conducted exactly as in daily life, and aims to give precisely the drill received by an apprentice. No charge is made, either for tuition or material, from male students taking the Industrials provided for them; nor from female students taking the ones provided for them, except in Instrumental Music. Male students taking either Printing or Telegraphy are charged $1.00 per month for the use of instruments and material.

DEPARTMENTS OF INSTRUCTION.

DEPARTMENT OF AGRICULTURE.

PRACTICAL AGRICULTURE.

Second Year:—General principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage.

Fourth Year: General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of a rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farm-houses; barns.

FARM ECONOMY.

Woman's Course, Fourth Year: Dairy products as human food; influences affecting character of milk; manufacture of condensed milk; the factory system and household plan of cheese-making; treatment of rennet; general process of cheese manufacture; subsequent treatment of cheese; butter-making; creameries; "deep" and "shallow" setting systems; general process of butter-making; packing and preserving butter.

DEPARTMENT OF BOTANY AND PRACTICAL HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest; also a course of lectures on Landscape Gardening. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard; fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture; shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in in the work of laying out and plotting grounds topographically.

CHEMICAL DEPARTMENT.

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life. Text-book, Ganot.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blow-pipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

Are constantly in progress in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

DRILL IN ENGLISH.

"As grammar was made after language, so ought it to be taught after language."—*Herbert Spencer.*

Drill in English embraces the following topics:

Sounds of the language; drill in producing the vocal, sub-vocal and aspirate elements with accuracy, distinctness and volume; vowels, consonants.

Letters: Form; power; rules for spelling, drill.

Words: Signification, properties, modifications, variations, relation and dependence.

Sentences: Drill in statement of ideas; description, clearness, terseness, vigor; business letters, discussion; capitalization; syllabication; punctuation; construction and analysis of sentences; elements, uses and names; criticism of compositions printed as written; proof reading; grammatical construction; superfluous words and clauses; drill in reading, speaking and penmanship.

Text-books: Webster's Academic Dictionary; Lee & Hadley's Advanced Lessons in Language.

Pupils deficient in spelling, etc., should enter the printing class, the printing-office being the work-shop of language.

STRUCTURE OF ENGLISH.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

MATHEMATICAL DEPARTMENT.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

DRILL IN ARITHMETIC.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Following this line, the student, so far from hammering away at "pure" science draws from the mathematical store-house what he needs, and sees why he needs it. Accuracy of calculation and posting, rather than a *mere* comprehension of the principles, is aimed at. Besides the recitation-room drill in business forms, practice in the field is also given. Estimating the number of cords in a pile of wood said to be 100x4x4 feet is one thing; measuring a pile of wood through which any number of cats may be harmlessly thrown, and in which four-feet sticks are the exception, is quite another and more difficult thing.

ARITHMETIC AND BOOK-KEEPING

Is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides ensuring arithmetical practice, develops practical skill in that important art.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admiral system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study. In addition, constant practice in the application of lines to metal and wood is furnished in the Blacksmith, Carpenter, Turning, Scroll-sawing, Carving, Engraving and Printing shops, and to fabrics in the Sewing Department.

PRACTICAL GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the use of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

PRACTICAL SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

STUDIES SPECIAL TO WOMAN.

Besides the studies already indicated, attention is called to the following:

SPECIAL HYGIENE.

As shown in the course, one term is devoted to the study of Physiology, from the text-book of Dr. J. C. Dalton. This is followed in the fourth year by a course of lectures to young ladies by Mrs. Cripps on the subject of Hygiene, embracing such instruction in hygienic matters as are valuable to woman.

FARM ECONOMY considers those affairs of the farm which usually come under the supervision of the farmer's wife or daughter, and which are not included in "gardening" or "household economy;" such as butter and cheese-making, dairy management, etc. A course of lectures is delivered by the Professor of Practical Agriculture. See heading, "Farm Economy."

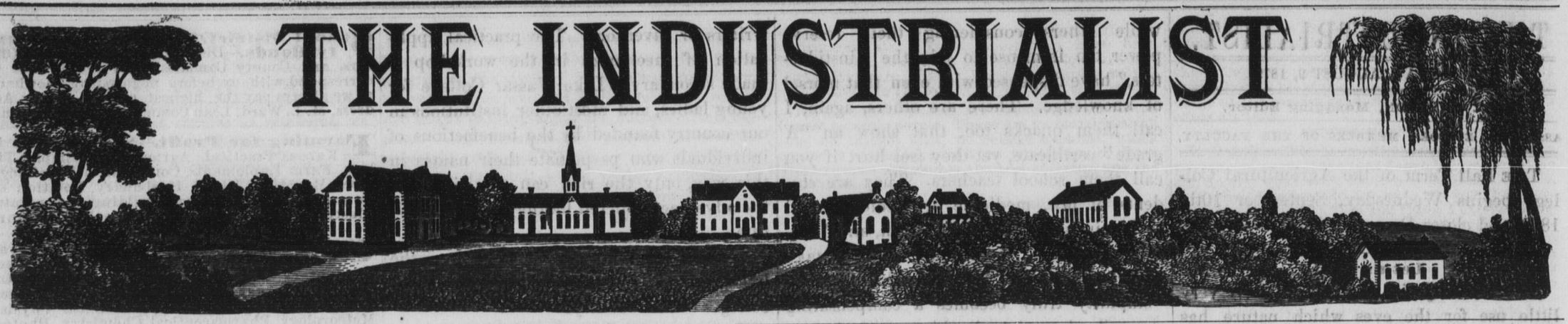
GARDENING is included in Practical Horticulture. See heading, "Landscape Gardening."

HOUSEHOLD CHEMISTRY. See heading, "Household Chemistry."

HOUSEHOLD ECONOMY

Follows Household Chemistry and consists of lectures by Mrs. Cripps on the art of house-keeping, embracing cookery, domestic management, and kindred topics. Many elderly gentlemen sufficiently know, and more young gentlemen will duly discover, that systematic knowledge of how cooking ought to be done is luminously different from the ability to do it. Instruction without practice can effect but little. Accordingly, a kitchen laboratory has been completely furnished, and affords every facility for drill in the art of cooking. This drill chiefly differs from that of a kitchen in the respect that after a girl has learned to wash dishes or pare potatoes she is not kept everlastingly at either. After full trial, we have found it just as feasible to give this practice, with profit and pleasure to the pupil, as it is to give laboratory practice in chemistry,—and no more expensive.

Printing!—Daily instruction and drill in the work of a First-Class Printer. The Literary Departments offer a thorough education in the construction and use of the English Language, as employed by the Proof-Reader; in Book-Keeping; and in Industrial Drawing, as the best developer of that taste necessarily exercised by every good Job Printer. The Printing Department is well furnished with all the facilities for a speedy mastery of the art of Printing, and is in charge of a practical printer. Besides regular class instruction in printing, the weekly publication of the INDUSTRIALIST by the Department furnishes advanced students the requisite drill in newspaper work.



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An Appreciative View of Sheep--Present and Prospective.

Farmers are finding out that sheep are the best paying stock. There is a constant demand for the lambs, which sell readily at $3 to $4 each, while the wool has sold this year from thirty to thirty-five cents a pound. A flock of medium sheep will average four pounds of wool a head, and if a little extra in size and well kept they will average five pounds, and perhaps more. Medium wool, that is, wool not fine nor coarse,—such as the best of Southdowns,—brought thirty-five cents. Such sheep will produce twenty-five per cent of twins, which adds just so much to the income of the flock. In proportion to the capital invested, a sheep will pay much better than a cow, with far less labor. Sheep will do better on short pasture than any other stock, and may be kept a considerable part of the summer on land designed for corn and buckwheat, and so keep these fields free from the growth of foul stuff. As gleaners they are very useful, and will convert bushes and weeds into the richest kind of manure, which otherwise would go to seed or prove a nuisance.

Farmers begin to appreciate the value of mutton more than they have for a change from pork, and as a healthful food. They can produce it cheaper than beef, as the fleece and manure derived from a sheep will actually pay for the cost of rearing, so that a farmer's mutton will cost him nothing. Not so with the pig. The important factor of fleece in the estimate of cost is wanting, so that a pound of pork probably costs as much as a pound of mutton, and there is no comparison between them for food. Mutton can be used so many ways as food, and all of them be conducive to good health and good digestion, while pork is pork. The American people will never allow the great woolen industries of this country to be stricken down. They are too closely allied with every section of country and with our manufacturing interests. The South want sheep to utilize their immense barrens, where the wools now grown in South America and South Africa may be produced; the West want sheep to convert the plains into profit, and to turn the arid wastes into usefulness; while the North and East want sheep to help restore fertility to deteriorated lands, and to add an important part to their incomes. New England, with its vast capital invested in woolen factories, will always be a friend to sheep, for no greater calamity could happen to it than to be entirely dependent upon foreign wool-growers.

It is evident, from the universal and combined interest the people of this country have in wool-growing and in woolen manufacturing, that they never will be at the mercy of other nations for their clothes. With these assurances, we may justly regard sheep husbandry as established on a permanent basis, with steady and certain profits to be derived from it. These profits will be enhanced as the demand for mutton is increased. This will be the case whenever farmers keep sheep to have good lambs, as good lambs make good sheep. This double axiom goes further and has an additional significance, in that good mutton sheep produce the best wool. The broadcloth days for farmers are over. They have found, like the English people, that coarser fabrics wear better; and under the stimulus of this sound sense, and the necessities of the times, fashion has changed, and the substantial cloths of the medium and coarse wools are taking the lead. The long staple fine wools sell at the highest prices for delaines and other fancy goods, but the short and fine-wooled Merinos drop below the best mutton breeds. The long and glassy staples of Cotswolds and Leicesters sell high for worsteds, but this kind of wool is limited in production. It takes turnips and oil cake to make this lustrous wool with a sufficient length to come up to the standard.

Americans do not practice this sort of feeding, and consequently do not produce much combing wool. It is grown in Canada extensively by the farmers who have learned the old country system of feeding. A few breeding flocks of Cotswolds and Leicesters produce combing wool, but the style of wool soon runs out when the same sheep are subjected to ordinary care and feeding. Messrs. Wolcott & Campbell, New York Mills, a few years ago imported a number of Lincolns from England, with the idea of introducing a superior combing-wooled sheep, but the breed has not spread, and by this time has doubtless run out. They sold out their flock of the pure Leicesters in this country to make room for the Lincolns, as a hardier and more profitable breed. Their old flock of Leicesters are all gone, gradually running down until they became worthless. The climate was unsuited to them. A close-wooled, medium sheep is the most valuable, and they may be had by crossing a Southdown buck upon the Merino or other breeds, and selecting the best ewe lambs. The best ewe lambs should always be saved, as this is the right way to make a good flock.—*Col. F. D. Curtis, in New York Tribune.*

CHILDREN with stuttering tendencies should be especially well nourished; they should take a great deal of physical and out-door exercise; care should be taken that their lungs are fully developed, and that their nerves are not irritated. Late hours and highly-seasoned food, and everything tending to derange, weaken or unduly excite, mentally or physically, should be avoided. The child should not be allowed to talk too rapidly, or when out of breath. If he has trouble with a word, he should be asked to repeat the whole sentence, and not merely the offending word. Oftentimes a serious mistake is made here. The child is drilled upon his most difficult words, and he comes to fear them; and, as a result, his ability to articulate them is continually lessened. He should not be permitted to associate with another stuttering child; indeed, no child should.—*Extract from lecture on "Stuttering and Stammering," by E. S. Werner.*

Every One to his Trade.

With the "new era" that is dawning upon the American farmer, no fact has been brought more plainly in view, or impressed more firmly upon the minds of all who believe in progress, than the conviction that a farmer must have a higher and better education, and that, too, a *special* education in all that pertains to the science and profession of agriculture.

The physician has his medical college, school of surgery, etc.;. the lawyer, his law school, and long years of study in his special profession; the soldier, the military school and West Point; the sailor, school ships and naval academies. He who would build a railroad, open a mine, or run a furnace, must have a special education and training in engineering, geology, etc. Even to become a good business man, the business college, with its special course and practice, is now thought to be a necessity. And it is true that of late years agricultural colleges have been fostered by national and State governments that are doing a great and good work; but how are we to educate the millions of children who will soon be the owners and cultivators of our farms? If they are intended for the farm, they should be educated for it.

Even as the physician must have a thorough knowledge of the structure of the body, knowing all its parts and their uses; and the producer of metals, of all that pertains to ores, their purity, etc.;—so should, and in fact must, the successful farmer of the future know the various constituents of soil, and have a good knowledge of chemistry, electricity, geology, how and why crops grow, etc.

To accomplish this great and important work best, it must be commenced in our common schools. Books for children, containing the elements of agriculture, must be introduced into every country school district.

At the last session of the National Grange action was taken upon this subject. Bro. T. B. Harwell, Master of the Tennessee State Grange, introduced a resolution "that the National Grange recommend to the Patrons of the several States to endeavor to have the study of the elementary principles of agriculture introduced into the public schools by legislative enactment." The resolution was reported upon favorably by the Committee on Education and adopted. We understand that the proper legislation has been secured in Tennessee, and a work ordered. What other State will next move in this direction?—*Cincinnati Grange Bulletin.*

Neglect of the Eye.

Whatever an ounce of prevention may be to other members of the body, it certainly is worth many pounds of cure to the eye. Like a chronometer watch this delicate organ will stand any amount of use, not to say abuse; but when once thrown off its balance, it very rarely can be brought back to its original perfection of action, or, if it is, it becomes ever after liable to a return of disability of function or the seat of actual disease. One would have supposed from this fact, and from the fact that modern civilization has imposed upon the eye an ever-increasing amount of strain, both as to the actual quantity of work done and the constantly increasing brilliancy and duration of the illumination under which it is performed, that the greatest pains would have been exercised in maintaining the organ in a condition of health, and the greatest care and solicitude used in its treatment when diseased. And yet it is safe to say that there is no organ in the body the welfare of which is so persistently neglected as the eye.

I have known fond and doting mothers take their children of four and five years of age to have their first teeth filled, instead of having them extracted, so that the jaw might not suffer in its due development and become in later years contracted; while the eye, the most intellectual, the most apprehensive, and the most discriminating of all our organs, receives not even a passing thought, much less an examination. It never seems to occur to the parents that the principal agent in a child's education is the eye; that through it it gains, not only its sense of the methods and ways of existence of others, but even the means for the maintenance of its own; nor does it occur to the parents for an instant that many of the mental as well as bodily attributes of a growing child are fashioned, even if they are not created, by the condition of the eye alone.

A child is put to school without the slightest inquiry on the part of the parent, and much less on the part of the teacher, whether it has the normal amount of sight; whether it sees objects sharply and well defined, or indistinctly and distorted; whether it be near-sighted or far-sighted; whether it sees with one or two eyes; or, finally, if it does see clearly and distinctly, whether it is not using a quantity of nervous force sufficient after a time, not only to exhaust the energy of the visual organ, but of the nervous system at large.—*Dr. E. G. Loring, in Harper's Magazine for August.*

THE INDUSTRIALIST.

SATURDAY, AUGUST 9, 1879.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

THE Fall Term of the Agricultural College begins Wednesday, September 10th, 1879, and closes December 18th, 1879.

Let us See!

The vast majority of mankind have very little use for the eyes which nature has given them. Almost any rough instruments capable of distinguishing light from dark, and the outlines of objects, would be to most people as useful as the complex, delicate and powerful organs of vision with which nature has endowed mankind. "Eyes have they but they see not"; and, from constant neglect and disuse, it is perfectly logical and in accordance with well-known natural principles to suppose that within the next three or four generations the majority of mankind will be eyeless, the skin of the eyelids adhering over these useless organs, as in the case of the fishes of the Mammoth Cave, and the nocturnal moles.

Let any one who supposes that he enjoys the full benefit of his perceptive faculties take some familiar object, as, for example, the house in which he lives. He can tell you its color, or the number of stories it contains, and its general form; but, if you press him for the number and form of the brackets of the cornice, or of the posts supporting the piazza, the number and arrangement of the chimneys, the chances are ten to one that he knows nothing positively of them. He cannot tell you whether the gate by which he enters his yard is curved at the top or straight, or whether the bottom board of the picket fence which he passes daily is white or brown. The attentive examination of any such familiar object, will furnish many surprises to every one, a fact which shows very conclusively that our senses have never been properly trained and developed, and for most of us the infinite variety of natural and artificial objects which surround us might as well not exist.

It is easier to find ten persons who are good reasoners than one who sees the whole of everything upon which his eyes are fixed, a fact without doubt largely attributable to a false education. Children are taught in our common schools constantly to give the reasons and whys and wherefores of things, at that age when the senses are most acute and the minds most active in the acquisition of facts.

It is not surprising that the suspicion that there is something radically wrong in our educational system is gaining ground; and this suspicion is strongly confirmed by the barren results so far obtained. What we need is more of the study of nature and less attention to books; and it is not until we get this that we shall have fully-developed men and less of mere bookishness.—*Prof. Shelton.*

Teachers vs. Quacks.

Perhaps the most important duty of the school board is the employment of a teacher; and as the season for this transaction is drawing near, we shall say a word or two on that subject. Quacks are found in all professions, but there is hardly a vocation in life which is maltreated by so many imposters as that of a common-school teacher. Broken-down preachers and lawyers, immature girls, ignorant fellows from the backwoods, and sickly invalids from the East, are just swarming our State. Some have attended an institute, and by hook and crook gobbled a second-grade certificate; while others, considering their reserve power too immense to join the "instidusters," have dispensed with even that morsel of knowledge. There are others, again, I call them quacks too, that show an "A grade" certificate, yet they feel hurt if you call them school teachers. They are students of law, medicine or theology; and their minds are "up in a balloon, sir!"

None of these individuals are fit to take charge of a school. Under such leadership "stupidity truly becomes a compensating mercy." A teacher should not only have a well-balanced mind, a thorough knowledge of the branches he is going to teach, a robust constitution and good health, but he should also know enough of human nature to judge what the mental powers of a child are capable of accomplishing at different ages. He should be a man of good moral character, because, in all the relations of life, there are few which are so intimate as that of teacher and pupil. The one mind here works upon the other with a force which is scarcely ever existent under other circumstances; and the influence is beyond all computation in its intensity. "That even the shadow of the Apostles had healing power, is no marvel to those who have been under the influence of such teachers."

A man who desires to teach for you that he may obtain money to prepare himself for some other profession, is not worthy of your consideration. A man who makes teaching a mere stepping-stone to something higher and more honorable in his estimation, will not feel that interest in the development of your children which characterizes a true teacher. The latter enters upon the work because he loves it, and with a view to making it his profession for life.

Young girls as school-masters are generally an experiment of very doubtful results. You cannot well afford it. Get a teacher of more mature age; or, better still, hire the one that taught your school last year. He is worth five dollars per month more this year than last, as the efficiency of a teacher increases with every year. In teaching, as well as anywhere else, you never will get "something for nothing."—*Prof. Walters.*

Industrial Schools. No. II.

The Stevens Institute of Technology is another industrial institution founded by private munificence. In 1867 Edwin A. Stevens, of Hoboken, N. J., gave a site and $650,000 in money for the establishment of an "institution of learning." As the character of the Institution was left to the executors of Mr. Stevens' will, they decided that it should be a School of Mechanical Engineering, and expended a great part of the money donated in erecting a building and furnishing it with expensive apparatus.

The current expenses of the Institution are met by tuition fees, which are $150 per year to citizens of New Jersey and $225 to those from other States. The attendance is not large, and principally from Hoboken and vicinity. The first class—one student—graduated in 1873; whole number of graduates, 75. Eight years, the time required to complete the whole course, are equally divided between the academic department and the Institute proper. In the academic department, Latin is studied through the whole course; Greek, two years. In the Institute proper, neither Latin nor Greek is studied, but German and French are taken through the whole course, the last two years being given to the reading of scientific works in those languages.

As a scientific school, Stevens Institute ranks high. Several members of its Faculty have obtained celebrity as scientific writers or inventors. The practical application of mechanics in the workshop is made secondary. Like Vassar College for young ladies, and most other institutions in our country founded by the benefactions of individuals who perpetuate their names in this way, only the rich can participate in the advantages offered by the Stevens Institute.

We will now collate a few items from the latest catalogues of some of the agricultural colleges of this country.

From the register of the Maryland Agricultural College for session ending June 24th, 1979, we learn that the Institution was founded in 1865, and that it has a fund of $110,000—the proceeds of 210,000 acres of land received from the Congressional endowment. It has one large building six stories high, and a farm of three hundred acres. The branches of study are grouped under the following departments: Civil engineering and astronomy; English literature, mental science and history; pure mathematics; physics and applied mathematics; *agriculture, architecture and drawing*; chemistry and natural history; ancient and modern languages. It has also a preparatory department, in which reading, writing, arithmetic, grammar, geography, and U. S. history are taught. Number of professors and instructors, 8; number of students in attendance, 75. Since 1875, eleven students have graduated, nine receiving degree of B. S. and two of B. A. Instruction is given in military science, and all of the students are required to wear a prescribed uniform. The expenses for board, room rent, etc., are about $250 per year. Tuition free to students from the State of Maryland and the District of Columbia.

The State Agricultural College of Colorado has recently been organized. The management of the College is in the hands of the State Board of Agriculture. The Faculty consists of three professors. "The leading object of the school is to impart a thorough and practical knowledge of *all* those branches and sciences which pertain to agriculture and the mechanic arts." The course of study covers four years. It does not include the ancient or modern languages. As the Congressional endowment is not yet available, the expenses of the Institution for two years have been provided for by legislative appropriations. Tuition is free to residents of the State.—*Prof. Ward.*

IN plowing it is never a good plan to turn up a mass of crude earth of several inches in depth, never before exposed to the sunlight and air. It will, unless heavy manuring is given as a top-dressing, result in loss. In deepening a soil, it is better to plow up an additional inch each year.—*Exchange.*

THE INDUSTRIALIST.

SATURDAY, AUGUST 9, 1879.

Instead of the usual circular or catalogue, we send the Industrialist to those desiring information about the Kansas State Agricultural College. We would call attention to the articles headed "Departments of Instruction," "Industrial Education," "Special Advantages," and "Directions to Applicants." If further information is desired, address Agricultural College, Manhattan, Kansas.

George Thompson writes that it is doubtful about his being able to return next term. Sickness in his father's family has interfered with his plans. We trust he may not be kept away.

Recent stock sales have been made at the College farm as follows: To John Glen, Glen Elder, Kas., one pair of Berkshire pigs; A. W. Rollins, Manhattan, one Berkshire boar pig; Jeff Mails, Manhattan, one Berkshire boar pig.

We received a pleasant call this week from Prof. Smith, of the State University. Prof. Smith is a young man,—receiving his appointment in less than a year after he graduated from Princeton,—but is already gaining a position among the educators of our State.

Those who wish to attend the National Temperance Camp-meeting at Bismarck Grove, which begins next Thursday and continues nearly two weeks, can obtain round-trip tickets from Manhattan for $2.00. This will afford everybody a fine opportunity to visit the city of Lawrence and enjoy its many attractions.

We wonder what philosophical mind penned the following, which we find going the rounds of the press: "When a New Jersey mosquito settles down to business upon the cheek of an insurance agent, the mind, by some singular process of association, reverts to the old problem of what would happen in the event of an irresistible force coming in contact with an immovable body."

Mr. Lender, a young man from Montgomery county, arrived here this week with the intention of attending College. He will build a small house some distance southeast of Prof. Gale's, and, with two or three more students, will live independent of the renters hereabouts. This is a sensible idea, an easy way of solving the problem of how to obtain rooms near the College, and we hope to see others follow the example set by Mr. Lender.

One of the prisoners who escaped from the Manhattan jail last week, ran into a small patch of corn in the court-yard and laid there two days. He then emerged from his hiding place, helped himself to a horse which was tied near the Baptist Church, and proceeded north to Randolph, where he was afterwards recaptured. The other two prisoners who escaped were pursued by the jailer and overtaken just before they reached the Kansas River.

The annual meeting of the Board of Regents of the College was delayed for some weeks on account of the necessary absence of some of the members from the State. It was believed that all could be present at the meeting called August 6th. Regent Henry, however, was detained in New York by the illness of his wife. The Regents present attended to some routine business and adjourned. It is desirable that there should be a full meeting of the Board when the positions now vacant in the Faculty are filled.

The people of Manhattan feel very jubilant over the prospects for at least one more railroad. Last Saturday Wabaunsee county voted bonds to the amount of $140,000 to aid in building the Manhattan, Alma & Burlingame Railroad, which secures the building of that road to this point within a year. This line is really a branch of the A., T. & S. F., which will be pushed on from Manhattan to Beatrice, Nebraska, and perhaps to Lincoln. The fact that so powerful a corporation as the Santa Fe Company are to build and operate this branch, and that it is to be the connecting link between two great roads,—an eastern and western one,—do away with the idea that it will be a one-horse affair, cutting off our northern and southern trade. Not only this, but it ensures a through line eastward to Chicago, or to the mountains west, giving competing rates for the transportation of all our exports and imports. The benefits which will accrue to Manhattan and to Riley county through the construction of this road can hardly be realized at present.

The above facts, and the further one that this county has been laboring for years to get a north and south road and is about to succeed, produced such enthusiasm and rejoicing among our citizens that they could not restrain themselves. On Monday evening they gathered in front of the Adams House and gave expression to their feelings by ringing bells, firing guns and anvils, by a bon-fire, and by speeches from a number of those present. We never saw so many people on the street at one time as were present on this occasion. During the progress of the meeting, resolutions were adopted thanking those who had given their time, money and talent to bring about the success of this project. Party divisions and personal animosities were laid aside, and all classes came together to celebrate this victory and pledge themselves to work shoulder to shoulder for the final success of this enterprise and all others which shall tend to build up our city and develop the resources of our county. Manhattan is awake to her interests.

NATIONALIST ITEMS.

The chicken-hunting season has commenced.

A large number of Germans arrived here from the Faderland last Sunday morning.

The Kansas Pacific party is still at work, running their line from Manhattan up the east side of the Big Blue.

The reclining-chair car, steel rails, and good speed, make the night express on the K. P. a very desirable train to take coming west.

Hon. J. S. Codding, of Pottawatomie county, sheared this year 3,500 pounds of wool from 445 head of Merino sheep, averaging a fraction less than eight pounds a head.

The entire expenditures of Riley county from August, 1878, to August, 1879, were $9,311.71. This is at a rate of about $1.15 a head for the population of the county, and is certainly a good showing. Some of our neighbors spend twice as much.

Leon Lacosta, late of Iowa, has established a soap factory at this place. It is located near Book's slaughter-house, on the south side of the river. This will supply a long-felt want, and we trust that every one will do what he can to help the enterprise along.

Last Saturday Drs. Lyman and Ward removed a polypus from the nose of L. R. Hastings, of Ogden, that is a curiosity. He had not been able to breathe through his nose for seven years. He is rapidly improving in health, since being relieved of this tumor, and his former deafness has entirely disappeared.

That bright and sparkling little newspaper gem, the INDUSTRIALIST, published by the Faculty of the Agricultural College, at Manhattan, has again made its appearance, after a short suspension during vacation. It is one of the best printed papers in the State, which proves that A. A. Stewart thoroughly understands the business of his honorable profession.—*James A. Scarbrough, in Smith County Pioneer.*

The time for the beginning of the fall term of the State Agricultural College, at Manhattan, has been changed this year. It now begins Wednesday Sept. 10th, and closes December 18th, 1879. This College is now on a good footing, and is a first-class institution in every particular. We think it, for the education of the average child of either sex, the best school in the State. Something besides mere book learning is needed for the child who has to make its own way in the world; and the Agricultural College gives a pupil, besides a thorough book education, a knowledge of the means whereby a livelihood may be earned after leaving school.—*Valley Falls New Era.*

The fall term of the State Agricultural College, at Manhattan, begins Wednesday, September 10th, 1879, and closes December 18th, 1879. The College is designed to be peculiarly a farm institution; and if the agricultural interest of the State is true to itself, and will throw around the College that moral support which will aid in upholding the hands of the Faculty, as well as the material support it requires, by sending their sons and daughters to it to receive a practical education, the Institution bids fair to develop into one of the best schools in the country. Shut out the dross of the old education, and let in the newer education. Instead of teaching the legends and stories of the fabled heathen gods and goddesses, teach the boys and girls how to conduct their every-day employment by the light of science.—*Kansas Farmer.*

SPECIAL NOTICES.

Those intending to take boarders next term, or who have rooms to rent, either furnished or unfurnished, are requested to notify Prof. Ward or A. A. Stewart of the fact.

The old Boarding Hall has been rented to Mr. Viles, who has contracted to furnish gentlemen students plain, table board at $1.50 per week. Unfurnished rooms, accommodating from two to four persons, at $1.50 a room per month. Those desiring to board themselves can obtain rooms in the old College building.

We have frequent applications, from young ladies and gentlemen in distant parts of the State, for situations in families, where they can pay their board, in whole or in part, by work, while attending College. Families in town, or in the immediate vicinity, desiring such help, are requested to communicate with Prof. Ward.

District boards about to issue school bonds are invited to correspond with us before negotiating elsewhere. We pay par for first-class 7 per cent bonds, issued upon our blanks. Bonds drawn on our blanks are not transferable, and hence may be safely sent by mail at letter postage. Blanks furnished free of charge on application to M. L. Ward, Loan Commissioner.

SPECIAL ADVANTAGES.

We enumerate a few of the special advantages which the Agricultural College presents to the young people of the State of Kansas:

First: Although an industrial school, as thorough and as complete an education—using the term in its popular sense—can be acquired here as in other schools. A student will make as rapid advancement here as elsewhere in the studies pursued, whether he remains here one or two years, or through the whole course.

Second: While obtaining a knowledge of English, mathematics, and the natural sciences, every student is learning some useful trade or art. This peculiar feature of the Agricultural College is a success. It should no longer be regarded as an experiment. Those who have been here one, two or three years are now in good positions, receiving good wages as telegraph operators, printers, carpenters, etc. Young men who have been through the course in practical agriculture and horticulture are rapidly becoming known as the best farmers in the localities in which they reside.

Third: The expenses are brought down to the lowest possible point. There are no matriculation fees, no tuition bills, no college customs, which compel a useless expenditure for badges or dress. The expenses are simply the cost of living, and the text-books used.

Fourth: The high moral and religious influence which exists at Manhattan. The students of the Agricultural College are young men and women of excellent character. Their average age is about eighteen years. They are deeply in earnest in their efforts for advancement. Of course there are a few exceptions, but the vicious or shiftless are soon thrown out. "Attend to business or leave" is the one rule. A wholesome religious influence pervades the Institution. The students' weekly prayer-meeting has been well sustained for more than ten years.

DIRECTIONS TO APPLICANTS.

TERMS OF ADMISSION.

Candidates for admission must be fourteen years of age, and pass a satisfactory examination in reading; arithmetic, through decimal fractions; and English grammar, to syntax. Classes are started at the beginning of each year in Drill in Arithmetic and Drill in English; and the pupil must have the knowledge above indicated, else he will be unable to retain position if admitted.

Pupils will be received at any time during the year, if able to pass an additional examination upon the subjects studied by the classes which they expect to enter. But they will find it greatly to their advantage to be present at the opening of each term, or as soon thereafter as posssble.

GRADES.

Both the Literary and Industrial recitations are graded daily upon a scale of 100; and an examination of all classes is made at the close of each month. A student not attaining an average grade of sixty is promptly dropped to a lower class, or excluded from the Institution until able to do so. The work of grading is strict and uniform in all the departments, and this process is rigorously used for sifting out incompetent and indolent pupils; thus more than accomplishing all that is designed to be effected by a "high standard of admission." Hence, the student's continuance in the College wholly depends upon his own action.

The course is based upon the determination to make the labor required in the preparation of one industrial and three literary recitations as much as the average student can perfectly perform, in ten hours a day. We design to give the pupil the worth of the time expended at College; and, in order thereto, he must do a full day's work with brain or hand. Only those students who can maintain a standing of ninety in each study will be allowed to take more than the prescribed number of recitations; and no one will be permitted to have less than one industrial and three literary recitations.

RELIGIOUS.

Unless otherwise directed by parents, students are required to attend chapel at 8:30 A. M. on academic days, and divine service once every Sabbath.

EXPENSES.

There are no charges whatever for enrollment, attendance or instruction in the regular courses; nor are there any "contingent fees" for the repair of buildings, for the use of books or apparatus, for diplomas, or the kindred privileges usually grouped under the term "contingent." Male students are furnished instruction, the use of apparatus, instruments or tools, in both the literary and industrial classes marked out for them, without any charge. And the same is true of female students in the regular classes provided for them. Printing and Telegraphy are industrials primarily provided for the education of female students, and male students taking either of these are charged $1 per month for use of instruments.

Instrumental music is a fine art or "accomplishment," rather than a mechanical art. We do not place it among our "industrials" in the same sense, or for the same purpose, that we do those provided for teaching the trades. Accordingly, the following fee is required from female students for tuition and the use of instruments:

Terms per week:

Private lessons, 2 a week, on any instrument, $1.00
Private lessons, 1 a week, on any instrument, .60
Class lessons, 2 a week, on any instrument, .65

Instruction in harmony, etc., etc., from ten to fifty cents per week, as the student may or may not be in other classes.

The only charge made for material in either the literary or industrial departments is for the chemicals used by students in laboratory practice, which are furnished at wholesale prices, and amount to but a small sum.

Furnishing an absolutely free education is as much as can be reasonably asked; and the Institution neither boards, clothes, nor supplies the student with text-books. Boarding can be obtained in private families at from $2.75 to $4 per week. Washing costs from seventy-five cents to one dollar per dozen. Text-books, which can be procured in Manhattan, cost from $2 to $5 per term.

No student need expend over $5 per week; and many of our best pupils are living at $1.25 per week. Students desiring to "board themselves" can do so at from $1 to $2 per week. In a club of four young men, renting a house, the average cost to each for the term was $1.11 per week.

LABOR.

Manual labor by the students may be for either of two purposes: First, to acquire skill in a given art; second, to earn money. In the first case, the labor is educational; in the second, it should be paid for by the party benefited.

Educational Labor.—Manual labor in the reciations of the Industrial Departments, like mental labor in those of the Literary Departments, is purely educational and will not be remunerated. While the interest of the student will be held paramount in the direction of this labor, the practice necessary to dexterity will be required.

Remunerated Labor.—When the Institution needs labor on the Farm or elsewhere which is not educational, but simply for its own profit, and which a student is able and willing to perform, it becomes an employer instead of a teacher, and he an employe instead of a scholar. It pays for work, he works for pay. The relation between them is commercial, not educational; and both parties must act upon business principles. Hence, the College furnishes only such employment as its own interests require, and will pay according to the value of the service rendered at from seven to ten cents an hour.

AMOUNT EARNED.

It is impossible to predict how much a given person can earn, since that depends upon what he can do and what work there is to be done. Hence, it is wholly impossible for us to answer the question so often asked: "Do you think I can meet my expenses by work?" Some students make one-half their expenses, some the whole, and exceptional men have made more than expenses. As a rule, a faithful boy skilled in farm work can earn half his expenses on the Farm or in the Nursery. During the year he can ordinarily acquire sufficient skill in the wood or iron shops to enable him to make articles for sale. The whole question is one for his own consideration and decision. We can teach all who come, but cannot absolutely *promise* anything more. Hitherto we have refrained from holding out strong inducements respecting the amount of labor we might have to offer; but in view of the fact that during each of the last three years we have had more to do than the students could perform, we are inclined to give greater and positive encouragement on this point. Any boy who is in dead earnest, who is familiar with farm operations, and who can raise $50 to start with, should be able to carry himself through the four years' course. And certainly this places an education within the reach of every determined boy. As yet we are unable to offer similar advantages to girls, not requiring labor in the College departments which they can perform.

RULES.

1. Behave as a true man or woman should, at all times and in all places.

2. Attend to your own business promptly, thoroughly and courteously; and vigorously let alone that of other people.

3. Penalty: "Leave!"

PUBLICATIONS.

The "Hand-Book," published in 1874, containing a full discussion of the educational question and the aims of the Institution, will be forwarded to any one desiring it.

THE INDUSTRIALIST, a weekly journal edited by the Faculty and published by the Printing Department, contains original and seasonable articles on the Farm, Orchard, Trades, Sciences, and Education. Price, 75 cents a year. Address A. A. Stewart, Manhattan.

CALENDAR.

Fall Term, 1879.—Will begin Wednesday, September 10th, 1879, and close December 18th, 1879.

TO NEW STUDENTS.

Bring the text-books you have been using. On arrival, first arrange for your boarding. A. A. Stewart will furnish information, either by letter or on application, concerning boarding places or rooms for rent. Report to the President at 8:30 A. M., immediately after chapel exercises, for enrollment.

For further information apply to Jno. A. Anderson, President, Manhattan, Kansas.

LITERARY SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in College building every Friday at 2 P. M. Ladies admitted. New students cordially invited to attend. GEORGE PERRY, President.
MISS GRACE PARKER, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Telegraph Hall every Saturday evening. Visitors, especially students, always welcome.
C. E. WOOD, President.
C. M. SHARTEL, Secretary.

RAILROAD TIME-TABLE.

KANSAS PACIFIC RAILWAY.

PASSENGER ARRIVES.

No. 2, going East	11:58 A. M.
No. 4, going East	3:28 A. M.
No. 1, going West	4:03 P. M.
No. 3, going West	4:51 A. M.
No. 7 (freight), going West	8:45 A. M.

Nos. 1, 2 and 7 run daily. No. 3 runs daily except Monday. No. 4 runs daily except Sunday. Passengers with tickets are carried on No. 7.
GEO. C. WILDER, Agent.

English Language.—The direct aim of the course is to make the student skillful in handling the machinery called language, just as an engineer handles his locomotive. Drill in English, History of English, Structure of English, Study of Words, and Rhetoric. Constant practice in the class room and, if desired, at the printer's cases.

Habits of Plants.—Thorough instruction in Vegetable Physiology; tracing the development of the root, stem, bud, leaf, flower and seed. Careful study of cereal grains, grasses, and other food-plants, and of native and foreign weeds. Special attention paid to the habits and best methods of preventing or destroying insects inimical to the Kansas Farmer.

Instrumental Music.—Instruction in instrumental music will be given in private lessons as formerly, and also in classes. The classes will be drilled after school hours, or at such times as are convenient to students. The number of students in each class, on piano or organ, is limited to three. Instruction will also be given on the various brass and orchestral instruments. Harmony, composition and instrumentation will be taught. For terms, see heading "Expenses" in article entitled, "Directions to Applicants."

THE INDUSTRIALIST.

SATURDAY, AUGUST 9, 1879.

Industrial Education.

The real value of an education to the student depends upon two things: First, the practical worth of the knowledge taught; and, second, the degree in which he makes it his own. Hence, the ability of any institution to give a practical education depends upon the kind and aim of the knowledge it teaches, and upon the thoroughness of the instruction therein. The State Agricultural College was directly endowed by Congress, and is guided by the State, for the specific purpose of furnishing to the industrial classes of Kansas a "practical" education, that is, "one fit for use." As its name indicates, and as the statistics of the industries of the State require, its chief work must be that of giving a useful and usable education to those who will engage in farming; and, therefore, the Farmer's Course must, from the nature of the case, be its main one.

FARMER'S EDUCATION.

Words and figures are merely instruments with which to record ideas. They are not themselves ideas, nor should they be made the chief end of an education. As a wagon is necessary to haul grain, so are they a necessary part of an education; but as the wagon is not the grain, so they are not the knowledge which the farmer converts into money. Hence, the classics and higher mathematics are not taught. But it will be noticed in the following course that so soon as the pupil acquires working skill in the use of the English language as a tool, and of figures and lines as mathematical tools, those arts and sciences which present knowledge that has a cash value to the farmer are taught as rapidly as their importance and thorough acquisition will permit. Studies numbered (1) and (4) in the second, third and fourth years are the spine of the course, to which the others are as ribs and muscle.

FARMER'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Practical Agriculture (advanced.)		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	
3. Polit. Economy, Practical Law.		3. Practical Geometry.		3. Algebra.		3. Industrial Drawing.	
4. Zoology.		4. Horticul., Landscape Gardening.		4. Practical Agricul. (elementary).		4. English Structure.	
5. Agricul. Chemistry Meteorology.		5. Organic, Analytical Chemistry.		5. Physics.		5. Adv'd Arithmetic, Book-keeping.	
6. Logic.		6. Practical Surveying.		6. Industrial Drawing.		6. U.S. History, Industrial Drawing.	

WOMAN'S EDUCATION.

Nearly one-half of our students are females, and the Woman's Course is prepared expressly for their liberal and practical education. We have no doubt whatever that practical men and women, who understand what it means and what it seeks to do, will fully endorse it.

WOMAN'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Farm Economy, Special Hygiene.		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	
3. Polit'l Economy, Practical Law.		3. Industrial Drawing.		3. Algebra.		3. Industrial Drawing.	
4. Zoology.		4. Horticul., Landscape Gardening.		4. English Literature.		4. English Structure.	
5. Phys'c'l Geography, Meteorology.		5. Organic, Household Chemistry.		5. Physics.		5. Adv'd Arith., Book-keeping.	
6. Logic.		6. Household Economy.		6. Industrial Drawing.		6. U.S. History, Industrial Drawing.	

MECHANIC'S EDUCATION.

Because of the adaptedness of the leading course to the wants of the intelligent mechanic, it has been found practically unnecessary to diverge from the Farmer's Course. Additional studies, specially adapted to the mechanic's use, will be furnished in a Post-Graduate's Course.

If it be urged that the distinctively agricultural knowledge taught in the Farmer's Course is not directly valuable to the mechanic, we reply that, admitting the point for the purpose of argument, yet: 1. This knowledge is of more practical value to the mechanic than is the Latin, Greek, or a half dozen other things embraced in the usual course preparatory to the professions; 2. That the great majority of Kansas mechanics will also be more or less engaged in agriculture; 3. That those studies in the course which are directly valuable to the mechanic, together with the shop facilities, offer a better mechanic's education than can be elsewhere found west of the Alleghanies.

INDUSTRIAL DEPARTMENTS.

Having knowledge in the head is one thing; ability to use it with the tongue, fingers or feet is quite another thing. Both are vital to success in practical life. A man might thoroughly understand the theoretical principles of carpentry, and yet, not having used the tools, be wholly unable to earn carpenter's wages. So in all other vocations. Accordingly, instruction is given in the following well-equipped Industrial Departments, and every student is required to recite in some one of them, as selected by the pupil or parent:

FOR MALE STUDENTS.	FOR FEMALE STUDENTS.
The Farm.	Dress-making.
The Nursery.	Printing.
Carpentry.	Telegraphy.
Cabinet-making.	Scroll-sawing.
Turning.	Carving.
Wagon-making.	Engraving.
Painting.	Photography.
Blacksmithing.	Instrumental Music.

Each of these departments is conducted exactly as in daily life, and aims to give precisely the drill received by an apprentice. No charge is made, either for tuition or material, from male students taking the Industrials provided for them; nor from female students taking the ones provided for them, except in Instrumental Music. Male students taking either Printing or Telegraphy are charged $1.00 per month for the use of instruments and material.

DEPARTMENTS OF INSTRUCTION.

DEPARTMENT OF AGRICULTURE.

PRACTICAL AGRICULTURE.

Second Year:—General principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage.

Fourth Year: General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of a rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farmhouses; barns.

FARM ECONOMY.

Woman's Course, Fourth Year: Dairy products as human food; influences affecting character of milk; manufacture of condensed milk; the factory system and household plan of cheese-making; treatment of rennet; general process of cheese manufacture; subsequent treatment of cheese; butter-making; creameries; "deep" and "shallow" setting systems; general process of butter-making; packing and preserving butter.

DEPARTMENT OF BOTANY AND PRACTICAL HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest; also a course of lectures on Landscape Gardening. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard; fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture; shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in in the work of laying out and plotting grounds topographically.

CHEMICAL DEPARTMENT.

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life. Text-book, Ganot.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blowpipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

Are constantly in progress in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

DRILL IN ENGLISH.

"As grammar was made after language, so ought it to be taught after language."—*Herbert Spencer.*

Drill in English embraces the following topics:

Sounds of the language; drill in producing the vocal, sub-vocal and aspirate elements with accuracy, distinctness and volume; vowels, consonants.

Letters: Form; power; rules for spelling, drill.

Words: Signification, properties, modifications, variations, relation and dependence.

Sentences: Drill in statement of ideas; description, clearness, terseness, vigor; business letters, discussion; capitalization; syllabication; punctuation; construction and analysis of sentences; elements, uses and names; criticism of compositions printed as written; proof reading; grammatical construction; superfluous words and clauses; drill in reading, speaking and penmanship.

Text-books: Webster's Academic Dictionary; Lee & Hadley's Advanced Lessons in Language.

Pupils deficient in spelling, etc., should enter the printing class, the printing-office being the work-shop of language.

STRUCTURE OF ENGLISH.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

MATHEMATICAL DEPARTMENT.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

DRILL IN ARITHMETIC.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Following this line, the student, so far from hammering away at "pure" science draws from the mathematical store-house what he needs, and sees why he needs it. Accuracy of calculation and posting, rather than a *mere* comprehension of the principles, is aimed at. Besides the recitation-room drill in business forms, practice in the field is also given. Estimating the number of cords in a pile of wood said to be 100x4x4 feet is one thing; measuring a pile of wood through which any number of cats may be harmlessly thrown, and in which four-feet sticks are the exception, is quite another and more difficult thing.

ARITHMETIC AND BOOK-KEEPING

Is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides ensuring arithmetical practice, develops practical skill in that important art.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admiral system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study. In addition, constant practice in the application of lines to metal and wood is furnished in the Blacksmith, Carpenter, Turning, Scroll-sawing, Carving, Engraving and Printing shops, and to fabrics in the Sewing Department.

PRACTICAL GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the use of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

PRACTICAL SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

STUDIES SPECIAL TO WOMAN.

Besides the studies already indicated, attention is called to the following:

SPECIAL HYGIENE.

As shown in the course, one term is devoted to the study of Physiology, from the text-book of Dr. J. C. Dalton. This is followed in the fourth year by a course of lectures to young ladies by Mrs. Cripps on the subject of Hygiene, embracing such instruction in hygienic matters as are valuable to woman.

FARM ECONOMY considers those affairs of the farm which usually come under the supervision of the farmer's wife or daughter, and which are not included in "gardening" or "household economy;" such as butter and cheese-making, dairy management, etc. A course of lectures is delivered by the Professor of Practical Agriculture. See heading, "Farm Economy."

GARDENING is included in Practical Horticulture. See heading, "Landscape Gardening."

HOUSEHOLD CHEMISTRY. See heading, "Household Chemistry."

HOUSEHOLD ECONOMY

Follows Household Chemistry and consists of lectures by Mrs. Cripps on the art of house-keeping, embracing cookery, domestic management, and kindred topics. Many elderly gentlemen sufficiently know, and more young gentlemen will duly discover, that systematic knowledge of how cooking ought to be done is luminously different from the ability to do it. Instruction without practice can effect but little. Accordingly, a kitchen laboratory has been completely furnished, and affords every facility for drill in the art of cooking. This drill chiefly differs from that of a kitchen in the respect that after a girl has learned to wash dishes or pare potatoes she is not kept everlastingly at either. After full trial, we have found it just as feasible to give this practice, with profit and pleasure to the pupil, as it is to give laboratory practice in chemistry,—and no more expensive.

Printing!—Daily instruction and drill in the work of a First-Class Printer. The Literary Departments offer a thorough education in the construction and use of the English Language, as employed by the Proof-Reader; in Book-Keeping; and in Industrial Drawing, as the best developer of that taste necessarily exercised by every good Job Printer. The Printing Department is well furnished with all the facilities for a speedy mastery of the art of Printing, and is in charge of a practical printer. Besides regular class instruction in printing, the weekly publication of the INDUSTRIALIST by the Department furnishes advanced students the requisite drill in newspaper work.

THE INDUSTRIALIST

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How Bessemer Steel is Made.

The following graphic description of the manufacture of Bessemer steel, as seen at the works of the Albany and Rensselaer Iron Company, is taken from an article in the Troy *Times* of recent date:

"Any one that had read the wonderful stories of ancient mythology, and did not know anything of the strange process of steel-making, were he to come unawares at night upon our Bessemer steel works, and catch a glimpse of the pyrotechnic splendors and fitful cimmerian gloom, in which the half-lighted forms of the sturdy workmen are moving, it is not unlikely he would imagine he had invaded the workshop of the Cyclops, where they were fabricating the thunderbolts of Jove. The sulphurous air, the intense brilliancy of the flames, the peculiar movements of the machinery, the roar of the blasts, the thud of the ponderous hammers, all conspire to impress him with a feeling of mystery and of unrealness.

"Even in daylight, when the imagination is less susceptible of weird impressions, the visitor's mind is unable to free itself of the strange influences exerted by witnessing here the wonderful and powerful agencies at work in converting iron into steel. At one time the dusky men aloft on the gallery of the cupola furnace, that have mingled the material in proportions of one pound of coal to every five pounds of iron, and are casting it within the dark mouth of this crucible, seem to him the servants of some great chemist who is seeking to evolve some hidden secret from nature's arcanum. And while waiting here to see what may next invite his gaze, he sees an immense ladle placed upon a scale. Suddenly the man who has been waiting by his side thrusts an iron spear into a closed orifice of the furnace, and a bright yellow stream of incandescent iron begins to flow from it into the prepared bowl of the ladle, which being filled with about 15,000 pounds of the liquid iron, is carefully turned over, its fervent contents running through a spout into the upturned mouth of the cast-iron converter. While the converter is receiving the contents of the ladle, the superintendent is explaining to his inquisitive visitor that the bottom of the former vessel is made of ten tuyeres (air admitters), each pierced with twelve three-eighth-inch holes, through which, when the vessel is in an upright position, roaring blasts of heated air pass into the converter at a pressure of twenty-five pounds to a square inch. As he is shown, the liquid iron as it enters does not rise up to the height of the tuyeres, for the converter in its present horizontal position has greater bulge on its lower side, which holds the melted metal there until the vessel is turned upright. In this position the bottom is connected with the blast pipe, through which the air is forced by the blowing engine. The pressure of air at this time is so great that it causes a violent ebullition of the iron within the upturned converter, blowing the melted iron into spray, and giving the oxygen of the entering air and the carbon and silicon of the liquid metal an immense surface of contact, so that perfect and rapid decarburization is effected without the use of any fuel.

"Now the foreman orders the man on the pulpit to turn the converter upright to connect it with the blast pipe. The huge receptacle, with its seven tons of liquid iron, immediately answers the handle of the regulator, and then begins a pyrotechnic display of intense and concentrated combustion that surpasses the effulgent light of the sun. As another writes: 'What a conflict of the elements is going on in that vast laboratory! A million balls of melted iron, tearing away from the liquid mass, surging from side to side, and plunging down again only to be blown out more hot and angry than before,—column upon column of air, squeezed solid like rods of glass by the force of 500 horses, piercing and shattering the iron at every point, chasing it up and down, robbing it of its treasures, only to be itself decomposed and hurled into the night in a roaring blaze. As the combustion progresses, the surging mass within the converter grows hotter, throwing out splashes of liquid slag, and the discharge from its mouth changes from sparks and streaks of red and yellow gas to thick, full, white, howling, dazzling flame. But such battles cannot last long. In a quarter of an hour the iron is stripped of every combustible alloy, and hangs out the white flag.'

"This is what Henry Bessemer's process does: The silicon of the pig iron is first oxidized, without intense flame, and then the graphite begins to be expelled, and more especially the combined carbon, and the heat towards the close of the process rises to 5,000 Fahrenheit, and the flame is full and dazzling.

"Before the iron becomes steel another brief but active commotion must occur within the capacious body of the converter. The blast is shut off, and the great vessel is again turned on its side to receive a complement of carbon and manganese, contained in a definite weight (in proportion to the weighed liquid already in the converter) of a melted pig iron, either Franklinite or Spiegeleisen, which is run into the vessel's mouth from a reverberatory furnace in the melting house. The conflict again rages, the mass glows and flames with brighter luminosity, more rapid are the chemical combinations, until the oxygen and other impurities of the iron come out in great commotion and enter into the added carbon and manganese; then all is quiet, and liquid, milky steel has been made by this last process of recarburization, discovered by Robert Mushet.

"The steel and its covering of slag are then poured from the converter into the distributing ladle, which is swung over the pit, where, by an adjustable stopper in the bottom of the ladle, the steel is run into the cast-iron ingot moulds which are grouped over the floor of the pit."—*Country Gentleman.*

THE value of the Charleston, S. C., phosphate beds was first discovered by Dr. N. A. Pratt, of that city, in 1866; and now the industry of raising the rocks and manufacturing the fertilizers has assumed very large proportions. In 1870, three years after the discovery of the beds, fourteen companies had been formed, representing several millions of dollars of capital, for working them; and the value of the fertilizers made from the phosphates in three years had reached upwards of two millions of dollars. At the present time the yearly production is about 200,000 tons, two-thirds of which is exported to England, and only one-third used by the farmers and planters of our own country. The commerce of Charleston has largely increased in consequence of this discovery, as vessels are continually arriving with cargoes of sulphur, guano, fish pumice, etc., and others are leaving loaded with the rock and the manufactured phosphates.—*Grange Bulletin.*

IN the manufacture of butter the custom has become general after churning to wash the butter with cold brine of greater or less strength; and not only to wash it once but twice, if the first washing does not remove every trace of buttermilk. Cold water, be it of the purest, and ice in the bargain, is not now used for butter-washing, brine having been found far preferable.—*Grange Bulletin.*

A Word to Farmers' Sons.

Farmers' sons are quite apt to suppose that they can only attain to any coveted position in life through the avenue of some trade or profession. They look about and find the wealthy men nearly all belonging to these classes. They do not stop to consider that only the wealthy ones come to view; that for every one of these who has acquired wealth or distinction, ninety-nine others have failed and disappeared, or have never risen to notice at all. They act on the belief that they are the only persons that can be called into public life, ignoring the fact that it is the training they get that constitutes the difference, rather than the calling. A farmer of equal learning and culture with the lawyer would, we believe, find himself in just as good request, with perhaps many chances in his favor. If the farmer allows the professional man to monopolize all the advantages at the start, he must expect to find himself at a disadvantage all the way through.—*Dirigo Rural.*

Remedies for Sunstroke.

New York City is threatened with a sunstroke season, and Dr. Jones, of the Board of Health, has issued the following circular, applicable in this city as well:

"Sunstroke is caused by excessive heat, and especially if the weather is 'muggy.' It is more apt to occur on the second, third or fourth day of a heated term than on the first. Loss of sleep, worry, excitement, close sleeping rooms, debility, abuse of stimulants, predispose to it. It is more apt to attack those working in the sun, and especially between the hours of eleven o'clock in the morning and four o'clock in the afternoon. On hot days wear thin clothing. Have as cool sleeping rooms as possible. Avoid loss of sleep and all unnecessary fatigue. If working indoors, and where there is artificial heat,—laundries, etc.,—see that the room is well ventilated. If working in the sun, wear a light hat (not black, as it absorbs heat), straw, etc., and put inside of it on the head a wet cloth or a large green leaf; frequently lift the hat from the head and see that the cloth is wet. Do not check perspiration, but drink what water you need to keep it up, as perspiration prevents the body from being overheated. Have, whenever possible, an additional shade, as a thin umbrella when walking, a canvas or board cover when working in the sun. When much fatigued do not go to work, but be excused from work, especially after eleven o'clock in the morning on very hot days, if the work is in the sun. If a feeling of fatigue, dizziness, headache or exhaustion occurs, cease work immediately, lie down in a shady or cool place; apply cloths to and pour cold water over head and neck.

"If any one is overcome by the heat, send immediately for the nearest good physician. While waiting for the physician, give the person cold drinks of water, or cold black tea, or cold coffee, if able to swallow. If the skin is hot and dry, sponge with or pour cold water over the body and limbs, and apply to the head pounded ice, wrapped in a towel or other cloth. If there is no ice at hand, keep a cloth on the head, and pour cold water on it, as well as on the body. If the person is pale, very faint, and pulse feeble, let him inhale ammonia for a few seconds, or give him a teaspoonful of aromatic spirits of ammonia in two tablespoonfuls of water with a little sugar."—*Kansas City Review of Science and Industry.*

EIGHT thousand beeves, on an average, are slaughtered in the vicinity of New York each week, for the market in that city. At forty-five pounds of tallow each, the total product per week would be 360,000 pounds.

THE INDUSTRIALIST.

SATURDAY, AUGUST 16, 1879.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

THE Topeka *Commonwealth* goes into fits because we asked last week if Hon. John A. Anderson was drawing a salary as President of the Agricultural College as well as a member of Congress. We did not for a moment suppose he would do anything of that kind, but the thought occurred to us upon seeing his name at the head of the Faculty, as President, in the INDUSTRIALIST, the official organ of the College. Mr. Anderson may have resigned last spring, but the INDUSTRIALIST still continues to keep his name in the directory as President, as the *Commonwealth* will discover if it examines that paper a little.—*Peabody Gazette.*

The INDUSTRIALIST keeps Mr. Anderson's name at the head of the Faculty for the reason that he is still President of the College. His resignation was placed in the hands of the Board shortly after his election to Congress, and this will be acted upon as soon as his successor is found. Except during and since the extra session of Congress, President Anderson has performed the duties of the President's office; but he has not received any salary during the time in which he conducted the campaign last fall, or since April last.—*Prof. Shelton.*

County Institutes.

Manifestly, the way to secure better schools in our State is to have better teachers; and to have better teachers, they must be educated and drilled specially for the work. Unquestionably, the best preparation a teacher can obtain to fit himself for his work, is to take a four years' course at one of our best normal schools; and as many persons as can avail themselves of that course should be encouraged to do so. But comparatively few of the five or six thousand teachers in our State are privileged to attend these schools, and some other provision must be made in order to reach the mass of our teachers. This want is partially met in our present system of county institutes.

These institutes are a success in this, that nearly all the teachers in our State are brought under their influence; but the success is only partial because the time is so limited. A term of four weeks is too short a course of instruction to be fraught with the best results. There is no royal road to a thorough education, no railroad or telegraph speed by which the goal may be reached; and if any one expects to qualify himself for teaching in a four weeks' institute, he will find himself much mistaken. The road to a qualification to teach the young to the best advantage is, step by step, little by little, and with a continued application of our minds. Yet much progress may be made in these institutes. The system is probably the best arrangement that can be made to supplement the work of our normal schools. Here the teachers of a county meet face to face. They receive instruction from a man of experience in the profession; they are drilled in the various branches of study in the common school; and they discuss questions of importance relating to the management of a school.

It must be that each one who attends these institutes receives some benefit, something that will stimulate him to teach a better school than he did before; and let me urge every teacher, and especially those who have not received a normal education, to attend these institutes regularly, and to aid in making them a means of elevating the standard of education in our noble State. —*Prof. Platt.*

Industrial Institutions. No. III.

The catalogue of the Tennessee University and State Agricultural College, 1878–9, is a well-printed pamphlet of sixty-four pages. The cover is ornamented with a neat vignette, perhaps the seal of the Institution. The words *agriculture* and *commerce*, in bold type, catch the eye. Agriculture is symbolized by a plough, a sheaf of grain, and a cotton-plant in full bloom; commerce, by a barge laden to the water's edge with the products of the soil.

Opening the pamphlet, we are struck by the prominence (apparently) given to agriculture in the University of Tennessee. We quote a few extracts from the first fourteen pages:

"The main feature of modern progress, next to the elevation of the masses, is the application of machinery to the industrial pursuits of life. In former times, men studied the forces of nature as means of recreation, but now they seek rather to conquer and domesticate them, and have attained such success in this that it is no exaggeration to say that the entire frame-work and running-gear of modern life is based on and controlled by science. Every improvement of the present age is, indeed, due to some scientific discovery. This condition of things, and the persuasion that the perpetuity of these improvements depends on the continuance of that scientific knowledge to which they owe their origin, has created an imperative demand for school and college instruction in those principles, or for what is known as practical education. Formerly it was thought that a college education was needed only by physicians, lawyers, clergymen, and gentlemen of 'elegant leisure.' All other occupations were mere handicrafts, or trades, to be practiced by the rule of thumb. But now something more than skill is demanded of the master workman. He must have knowledge, and this knowledge he must seek in the schools.

"The Science College is a response to these demands. It is a later and a riper fruit of the same general movement that gave rise to the common schools for the people. In some measure it is but a further development of the same growth; different only in that it answers to a higher and more special want.

"The Science College has for its primary objects to teach the principles of the physical and natural sciences, which relate to and underlie all of the industrial occupations, and to train its pupils to such mental habits as will most thoroughly fit them for their special work in life. But the Science College holds that to develop the mental and moral faculties of its students is of right the primary and dominant purpose of every college, be it classical or scientific. Culture is its end and aim. No college can wisely take for its highest or recognize as its ultimate aim, the preparation of its students for being mere bread-winners,—to qualify them merely for making a living. * * *

"One of the highest practical aims of the Science College is to elevate the standard of life among the industrial classes; and to lower its work to this level is to rob it of half its value, and that the higher and better half. The very general shrinkage in values of property, and the common necessity of working for a living, lends color to this low view of the aims of education, even with some who really and rightly value the higher education. It is not that they appreciate culture less, not that they admire scholarship less, but that they feel more the need of a working education. Time, however, will remedy this. Day by day, and year by year, science will be esteemed and pursued more for itself alone; and the estimates of the relative commercial and culture values of a scientific education will change."

The latter part of the quotation expresses the "true inwardness" of the policy which invariably prevails where the land endowment of 1862 has been absorbed by a literary college. The University of Tennessee, organized as a college in 1807 and chartered as a university in 1840, may be taken as a representative of the class of institutions referred to.

Upon further examination of the pamphlet, we find the University of Tennessee to be a literary institution with an agricultural attachment; or, as a distinguished citizen of this State once said of another college, "it is a literary kite with an agricultural tail." In the list of the Faculty, placed near the head, is the name of a Professor of Agriculture and Horticulture; but, as we examine the internal arrangement of the Institution, we find the same gentleman at the head of the School of Natural History. This school is common to the three colleges which comprise the University. These are first and prominent, of course: The College of Agriculture, the College of Engineering and Mechanic Arts, and the Classical College.

Now, why this prominence to agriculture (on paper), when in reality every student who goes through the classical or engineering courses takes the same studies as those in the agricultural course? It is doubtless to make the University popular, and to quiet the clamors of the people, who are demanding that the proceeds of the endowment of 1862 should be used to promote the interests of the industrial classes.

But the people of Tennessee will not remain contented with the present arrangement. They will demand an agricultural college in fact, not a theoretical one in the University catalogue. In order to obtain this in Tennessee, and in other States similarly situated, the industrial college will have to be separated from the professional or literary. A college of agriculture and mechanic arts cannot form an integral part of a State university. The daily pursuits of the farmer and the lawyer are not more unlike than the course of training each should pursue—beyond the common school—to fit himself for a successful career in his chosen calling.

The Faculty of the Tennessee University numbers eight. Number of students in collegiate and preparatory departments, 244, two of whom have agriculture standing opposite their names.—*Prof. Ward.*

A Packing House Needed.

Manhattan is located in the best stock-raising portion of Kansas. Animals of all kinds are remarkably healthy and prolific here. More native cattle and hogs are shipped from Manhattan than from any other place in the interior of the State, and the supply is rapidly increasing.

Within a few months we will have railroad competition to all the chief markets of the world, and direct connection with all parts of the State. In this respect our advantages will be equal to that of the most favored localities, and will surpass those of all but a few places.

Stone, brick, lime and sand of excellent quality for building purposes are cheaper than at any other place we know of, and, as labor is also low, buildings can be erected here on better terms than elsewhere.

The salt works at Alma, 25 miles east, and Solomon City, about 75 miles west, are on competing lines of road, and this necessary article for packing will, therefore, always be cheap in Manhattan.

Ice of the best quality can be procured for the cutting, in exhaustless quantities, from the Big Blue river, which bounds the town site on the east, or from the Kansas, which skirts it on the south.

There is a large home demand for the spare-ribs and other parts that it is not desirable to pack, and there is a soap factory in operation to purchase the refuse grease.

The town is beautifully located, is inhabited by a moral, intelligent and thrifty class of people, has superior church and educational facilities, contains no licensed saloons, and is a desirable place of residence.

Persons wishing to go into business would therefore do well to visit Manhattan at once, and investigate its advantages for themselves. —*Nationalist.*

OVER two and a quarter million acres of land have been taken up in Kansas during the past nine months, under the homestead and pre-emption laws.

THE INDUSTRIALIST.

SATURDAY, AUGUST 16, 1879.

Instead of the usual circular or catalogue, we send the Industrialist to those desiring information about the Kansas State Agricultural College. We would call attention to the articles headed "Departments of Instruction," "Industrial Education," "Special Advantages," and "Directions to Applicants." If further information is desired, address Agricultural College, Manhattan, Kansas.

Mark Reeve went down to Americus Tuesday on a short visit. He will return next week.

The grapes in the College vineyard have been sold to Blood & Brooks, grocers, Manhattan.

The railroads up the Blue and the road to Burlingame will make Manhattan easy of access from all parts of the State.

Mr. Leach states that he will be back next term, and sends the names of several who are coming from Shawnee county.

Just as the croaker was about to say, "Late planted corn will be a failure," the rain came. Othello's occupation is gone.

New students are coming in already. Yesterday L. E. Hobbs and Chas. W. Moore arrived from Essex county, Mass. They have taken a room at the Boarding Hall.

Three weeks from next Wednesday school begins. Then the monotony of the past three months will have ceased, and it will seem more like living than simply staying—as now.

Cherokee county was better represented at the College last year than any other county in the State except Riley; and, from present indications, she will have a still larger representation this year.

Mrs. Morton and son, from Maine, sister and nephew respectively of our venerable carpenter, Col. Hawkes, are visiting at his home. Mr. Morton will return to the East to-day, but his mother will remain here for some time.

We are receiving a great many letters of inquiry from the young people of Johnson county. Guess Morrow, Hulett, Misses McGuire and Millikan, and the Dickson boys, are speaking good words for the College in their respective communities.

The August number of the *Western Review of Science and Industry*, published at Kansas City, Mo., has been received. Like its predecessors, it is replete with scientific and general information. We are pleased to know that the *Review* is in a prosperous condition. It deserves a hearty support.

We know our readers, especially the students, will read with pleasure D. S. Leach's well-written letter, in another column. Short letters from the students are always acceptable. Mr. Leach's communication is rather lengthy, but is full of interest. We expect to hear from Mr. Rushmore next week, and from Mr. Thompson the week after.

We (the devil and the types) are alone in our glory this week. The Managing Editor and all his associates are gone. Prof. Shelton is East on business and pleasure, Prof. Ward and family are encamped at Bismarck Grove, Prof. Platt is admiring the beauties of southern Kansas, Prof. Walters is rusticating near Milford, and we are—here trying to make locals.

President Anderson's son "B" has entered a private school in Massachusetts. We think "B" has spent too many summers in the free air of Kansas,—basking in her sunshine, bathing in her rivers, and gunning on her prairies,—to ever be satisfied with school life in the East. Come back to Kansas and get a "sensible education" at the Agricultural College!

Prof. Shelton started for the East last Wednesday noon. He will be absent a couple of weeks. We have no idea that while absent he will be able to shake from his shoulders his responsibility as editor of the INDUSTRIALIST, and a "sense of duty" will compel him to send us "notes by the way." The Professor has worked hard the past year. May he have a good time, and may our turn come soon.

An effort is being made by the class of 1879 to organize the classes which have graduated since and including 1876 into an Alumni Society. The last class is to sustain the relation of charter members, and the members of other classes are to be admitted upon application and the payment of a fee of one dollar. The first public meeting will be held next Commencement. Officers for the ensuing year have been elected as follows: President, Prof. G. H. Failyer, class of '77; Vice-President, A. N. Godfrey, '78; Secretary, H. C. Rushmore, '79; Treasurer, A. T. Blain '79. An organization of this kind existed here some years ago, but has been abandoned. We hope to see the alumni of the College take hold of this movement and make it a success. The objects sought to be gained by such an organization are worthy the attention of every alumnus.

A LETTER FROM TOPEKA.

Editors Industrialist:—Topeka, like all Kansas cities, is in a thriving condition, and bids fair to become the metropolis of the State. Its business men are energetic, goahead gentlemen, full of business tact and enterprise; and their ranks are being constantly reinforced by the emigration of moneyed men from the East who find a better field for investment in Kansas than elsewhere.

As yet Topeka has few public edifices worthy of special notice, although the erection of them is only a question of time. I presume the new Government Building, on the corner of 5th and Kansas Avenue, will be a handsome structure, as it is to be built of eastern material and according to designs furnished by the Treasury Department. The Asylum for the Insane, located two miles west of the city, is an excellent building and a credit to the State. Washburn and Bethany are both models of architectural beauty and neatness. The Faculty of Washburn are sociable, scholarly men, and eminently qualified for their respective positions; but the school will not grow much so long as the tuition remains as high as it is at present. Bethany is a boarding school for young ladies, and we hear is quite successful.

Topeka has nearly 13,000 inhabitants. It has the most inefficient police force of any city in the State. Burglaries are of frequent occurrence, and very few arrests are made. The city stands in great need of more wells of good water. There is scarcely a business house on Kansas Avenue where you can get water fit to drink. A large part of the water is hauled in wagons. But saloons are plenty; and perhaps this accounts for the absence of water. I was very much amused the first time I passed up Kansas Avenue. On the Avenue, between 5th and 6th streets, are two signs, side by side, one of which reads, "Milwaukee Beer, Wines and Liquors"; the other, "Temperance Headquarters, Cold Water Free." It strikes me this is mighty suggestive, but I suppose it is all right. If you wish to fight the enemy, do so at close range.

By the way, a new industry has been started in Topeka, which is nothing less than the manufacture of lumber from paper. All that is now required are establishments in different parts of the State to convert into paper the straw that is annually wasted. The boards are strong and durable, will not burn, are impervious to water, and admit of a high polish.

A sketch of Topeka, however short, would be incomplete without mentioning George W. Martin's Publishing House. It is usual, in such cases, to say that "it is a model of neatness and comfort"; but in this case we are compelled to forego that pleasure, for the building is altogether too small to accommodate such a business,—everybody seems to be in everybody's way. The work done here is excelled by none, and an air of business thrift pervades the whole establishment. Among all the different publications issued in Topeka, none of them have that perfection of typographical neatness and accuracy exhibited in the columns of the INDUSTRIALIST.

The country around Topeka is of unsurpassed fertility, peopled by a class of sober, industrious and well-to-do farmers. As soon as the county herd law was repealed, the farmers' pocket-books assumed a different shape. They now jingle with tangible evidences of the success of the resumption act. As indicated, cattle-raising is the principal vocation, farming being made a subsidiary matter; and the cattle shipped from this county annually are numbered by the thousands. If some of Prof. Shelton's Short-horns were distributed among the herds, I think the results would be more satisfactory; for, as he says, it is just as easy to drive 1,800 pounds of beef to market as it is to drive half that amount. Of course they have some blooded stock here, but I have seen none that were equal to those on the College farm. I never realized so fully as now the importance of a more thorough education among the farmers. For instance, how much better they could succeed in stock-raising if they only understood the fundamental principles of the science. In traveling through the county I find that some of the most intelligent stock-raisers are making mistakes that would not be made by the youngest graduate of the College.

I meet a great many young men and women who will attend some institution of learning, and of course I have done the best I could to induce them to attend school at Manhattan, believing it to be the best institution of learning in the West.

Yours, respectfully, D. S. LEACH.

Ex-U. S. Senator Pease, of Miss., came in from the West last week, and, after stopping a day or two with Judge Brown, started East. He intends, however, to return with his family, about Oct. 1st, and make Manhattan his future home.—*Nationalist.*

NATIONALIST ITEMS.

Dr. Detmers was in town last week, and returned to Chicago on Monday.

A new platform is being built at the depot on all sides but the south. Now for a ladies' waiting-room.

The Y. P. C. U. are making arrangements for a dramatic lecture on Pilgrim's Progress, for the evening of Aug. 27th.

Rev. Wm. Campbell, wife and youngest child are off on a summer tour, in the upper Mississippi country, and will be absent about a month.

The Fair that will be held in Manhattan from Oct. 7th to 10th will undoubtedly have the best display of stock ever seen in this place—if not in the State.

A plum branch brought to our office from Jerry Haines' place was literally covered with fruit. We never saw plums hang thicker. He says the tree bears every year.

Messrs. Dow & Brown have sold Prof. Lee's farm, up the Wild Cat, to Mr. Wm. Watson, the noted stock-breeder, who will remove his splendid herd of Berkshires to that place.

DIRECTIONS TO APPLICANTS.

TERMS OF ADMISSION.

Candidates for admission must be fourteen years of age, and pass a satisfactory examination in reading; arithmetic, through decimal fractions; and English grammar, to syntax. Classes are started at the beginning of each year in Drill in Arithmetic and Drill in English; and the pupil must have the knowledge above indicated, else he will be unable to retain position if admitted.

Pupils will be received at any time during the year, if able to pass an additional examination upon the subjects studied by the classes which they expect to enter. But they will find it greatly to their advantage to be present at the opening of each term, or as soon thereafter as possible.

GRADES.

Both the Literary and Industrial recitations are graded daily upon a scale of 100; and an examination of all classes is made at the close of each month. A student not attaining an average grade of sixty is promptly dropped to a lower class, or excluded from the Institution until able to do so. The work of grading is strict and uniform in all the departments, and this process is rigorously used for sifting out incompetent and indolent pupils; thus more than accomplishing all that is designed to be effected by a "high standard of admission." Hence, the student's continuance in the College wholly depends upon his own action.

The course is based upon the determination to make the labor required in the preparation of one industrial and three literary recitations as much as the average student can perfectly perform, in ten hours a day. We design to give the pupil the worth of the time expended at College; and, in order thereto, he must do a full day's work with brain or hand. Only those students who can maintain a standing of ninety in each study will be allowed to take more than the prescribed number of recitations; and no one will be permitted to have less than one industrial and three literary recitations.

RELIGIOUS.

Unless otherwise directed by parents, students are required to attend chapel at 8:30 A. M. on academic days, and divine service once every Sabbath.

EXPENSES.

There are no charges whatever for enrollment, attendance or instruction in the regular courses; nor are there any "contingent fees" for the repair of buildings, for the use of books or apparatus, for diplomas, or the kindred privileges usually grouped under the term "contingent." Male students are furnished instruction, the use of apparatus, instruments or tools, in both the literary and industrial classes marked out for them, without any charge. And the same is true of female students in the regular classes provided for them. Printing and Telegraphy are industrials primarily provided for the education of female students, and male students taking either of these are charged $1 per month for use of instruments.

Instrumental music is a fine art or "accomplishment," rather than a mechanical art. We do not place it among our "industrials" in the same sense, or for the same purpose, that we do those provided for teaching the trades. Accordingly, the following fee is required from female students for tuition and the use of instruments:

Terms per week:

Private lessons, 2 a week, on any instrument, $1.00
Private lessons, 1 a week, on any instrument, .60
Class lessons, 2 a week, on any instrument, .65

Instruction in harmony, etc., etc., from ten to fifty cents per week, as the student may or may not be in other classes.

The only charge made for material in either the literary or industrial departments is for the chemicals used by students in laboratory practice, which are furnished at wholesale prices, and amount to but a small sum.

Furnishing an absolutely free education is as much as can be reasonably asked; and the Institution neither boards, clothes, nor supplies the student with text-books. Boarding can be obtained in private families at from $2.75 to $4 per week. Washing costs from seventy-five cents to one dollar per dozen. Text-books, which can be procured in Manhattan, cost from $2 to $5 per term.

No student need expend over $5 per week; and many of our best pupils are living at $1.25 per week. Students desiring to "board themselves" can do so at from $1 to $2 per week. In a club of four young men, renting a house, the average cost to each for the term was $1.11 per week.

LABOR.

Manual labor by the students may be for either of two purposes: First, to acquire skill in a given art; second, to earn money. In the first case, the labor is educational; in the second, it should be paid for by the party benefited.

Educational Labor.—Manual labor in the recitations of the Industrial Departments, like mental labor in those of the Literary Departments, is purely educational and will not be remunerated. While the interest of the student will be held paramount in the direction of this labor, the practice necessary to dexterity will be required.

Remunerated Labor.—When the Institution needs labor on the Farm or elsewhere which is not educational, but simply for its own profit, and which a student is able and willing to perform, it becomes an employer instead of a teacher, and he an employe instead of a scholar. It pays for work, he works for pay. The relation between them is commercial, not educational; and both parties must act upon business principles. Hence, the College furnishes only such employment as its own interests require, and will pay according to the value of the service rendered at from seven to ten cents an hour.

AMOUNT EARNED.

It is impossible to predict how much a given person can earn, since that depends upon what he can do and what work there is to be done. Hence, it is wholly impossible for us to answer the question so often asked: "Do you think I can meet my expenses by work?" Some students make one-half their expenses, some the whole, and exceptional men have made more than expenses. As a rule, a faithful boy skilled in farm work can earn half his expenses on the Farm or in the Nursery. During the year he can ordinarily acquire sufficient skill in the wood or iron shops to enable him to make articles for sale. The whole question is one for his own consideration and decision. We can teach all who come, but cannot absolutely *promise* anything more. Hitherto we have refrained from holding out strong inducements respecting the amount of labor we might have to offer; but in view of the fact that during each of the last three years we have had more to do than the students could perform, we are inclined to give greater and positive encouragement on this point. Any boy who is in dead earnest, who is familiar with farm operations, and who can raise $50 to start with, should be able to carry himself through the four years' course. And certainly this places an education within the reach of every determined boy. As yet we are unable to offer similar advantages to girls, not requiring labor in the College departments which they can perform.

RULES.

1. Behave as a true man or woman should, at all times and in all places.

2. Attend to your own business promptly, thoroughly and courteously; and vigorously let alone that of other people.

3. Penalty: "Leave!"

PUBLICATIONS.

The "Hand-Book," published in 1874, containing a full discussion of the educational question and the aims of the Institution, will be forwarded to any one desiring it.

THE INDUSTRIALIST, a weekly journal edited by the Faculty and published by the Printing Department, contains original and seasonable articles on the Farm, Orchard, Trades, Sciences, and Education. Price, 75 cents a year. Address A. A. Stewart, Manhattan.

CALENDAR.

Fall Term, 1879.—Will begin Wednesday, September 10th, 1879, and close December 18th, 1879.

TO NEW STUDENTS.

Bring the text-books you have been using. On arrival, first arrange for your boarding. A. A. Stewart will furnish information, either by letter or on application, concerning boarding places or rooms for rent. Report to the President at 8:30 A. M., immediately after chapel exercises, for enrollment.

For further information apply to Jno. A. Anderson, President, Manhattan, Kansas.

RAILROAD TIME-TABLE.

KANSAS PACIFIC RAILWAY.

PASSENGER ARRIVES.

No. 2, going East..... 11:58 A. M.
No. 4, going East..... 3:28 A. M.
No. 1, going West..... 4:03 P. M.
No. 3, going West..... 4:51 A. M.
No. 7 (freight), going West..... 8:45 A. M.

Nos. 1, 2 and 7 run daily. No. 3 runs daily except Monday. No. 4 runs daily except Sunday. Passengers with tickets are carried on No. 7.

GEO. C. WILDER, Agent.

THE INDUSTRIALIST.

SATURDAY, AUGUST 16, 1879.

Industrial Education.

The real value of an education to the student depends upon two things: First, the practical worth of the knowledge taught; and, second, the degree in which he makes it his own. Hence, the ability of any institution to give a practical education depends upon the kind and aim of the knowledge it teaches, and upon the thoroughness of the instruction therein. The State Agricultural College was directly endowed by Congress, and is guided by the State, for the specific purpose of furnishing to the industrial classes of Kansas a "practical" education, that is, "one fit for use." As its name indicates, and as the statistics of the industries of the State require, its chief work must be that of giving a useful and usable education to those who will engage in farming; and, therefore, the Farmer's Course must, from the nature of the case, be its main one.

FARMER'S EDUCATION.

Words and figures are merely instruments with which to record ideas. They are not themselves ideas, nor should they be made the chief end of an education. As a wagon is necessary to haul grain, so are they a necessary part of an education; but as the wagon is not the grain, so they are not the knowledge which the farmer converts into money. Hence, the classics and higher mathematics are not taught. But it will be noticed in the following course that so soon as the pupil acquires working skill in the use of the English language as a tool, and of figures and lines as mathematical tools, those arts and sciences which present knowledge that has a cash value to the farmer are taught as rapidly as their importance and thorough acquisition will permit. Studies numbered (1) and (4) in the second, third and fourth years are the spine of the course, to which the others are as ribs and muscle.

FARMER'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Practical Agriculture (advanced.)		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	
3. Polit'l Economy, Practical Law.		3. Practical Geometry.		3. Algebra.		3. Industrial Drawing.	
4. Zoology.		4. Horticul., Landscape Gardening.		4. Practical Agricul. (elementary).		4. English Structure.	
5. Agricul. Chemistry		5. Organic, Analytical Chemistry.		5. Physics.		5. Adv'd Arithmetic, Book-keeping.	
6. Logic.		6. Practical Surveying.		6. Industrial Drawing.		6. U. S. History, Industrial Drawing.	

WOMAN'S EDUCATION.

Nearly one-half of our students are females, and the Woman's Course is prepared expressly for their liberal and practical education. We have no doubt whatever that practical men and women, who understand what it means and what it seeks to do, will fully endorse it.

WOMAN'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Farm Economy, Special Hygiene.		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	
3. Polit'l Economy, Practical Law.		3. Industrial Drawing.		3. Algebra.		3. Industrial Drawing.	
4. Zoology.		4. Horticul., Landscape Gardening.		4. English Literature.		4. English Structure.	
5. Phys'l Geography, Meteorology.		5. Organic, Household Chemistry.		5. Physics.		5. Adv'd Arith., Book-keeping.	
6. Logic.		6. Household Economy.		6. Industrial Drawing.		6. U. S. History, Industrial Drawing.	

MECHANIC'S EDUCATION.

Because of the adaptedness of the leading course to the wants of the intelligent mechanic, it has been found practically unnecessary to diverge from the Farmer's Course. Additional studies, specially adapted to the mechanic's use, will be furnished in a Post-Graduate's Course.

If it be urged that the distinctively agricultural knowledge taught in the Farmer's Course is not directly valuable to the mechanic, we reply that, admitting the point for the purpose of argument, yet: 1. This knowledge is of more practical value to the mechanic than is the Latin, Greek, or a half dozen other things embraced in the usual course preparatory to the professions; 2. That the great majority of Kansas mechanics will also be more or less engaged in agriculture; 3. That those studies in the course which are directly valuable to the mechanic, together with the shop facilities, offer a better mechanic's education than can be elsewhere found west of the Alleghanies.

INDUSTRIAL DEPARTMENTS.

Having knowledge in the head is one thing; ability to use it with the tongue, fingers or feet is quite another thing. Both are vital to success in practical life. A man might thoroughly understand the theoretical principles of carpentry, and yet, not having used the tools, be wholly unable to earn carpenter's wages. So in all other vocations. Accordingly, instruction is given in the following well-equipped Industrial Departments, and every student is required to recite in some one of them, as selected by the pupil or parent:

FOR MALE STUDENTS.	FOR FEMALE STUDENTS.
The Farm.	Dress-making.
The Nursery.	Printing.
Carpentry.	Telegraphy.
Cabinet-making.	Scroll-sawing.
Turning.	Carving.
Wagon-making.	Engraving.
Painting.	Photography.
Blacksmithing.	Instrumental Music.

Each of these departments is conducted exactly as in daily life, and aims to give precisely the drill received by an apprentice. No charge is made, either for tuition or material, from male students taking the Industrials provided for them; nor from female students taking the ones provided for them, except in Instrumental Music. Male students taking either Printing or Telegraphy are charged $1.00 per month for the use of instruments and material.

DEPARTMENTS OF INSTRUCTION.

DEPARTMENT OF AGRICULTURE.

PRACTICAL AGRICULTURE.

Second Year:—General principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage.

Fourth Year: General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of a rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farmhouses; barns.

FARM ECONOMY.

Woman's Course, Fourth Year: Dairy products as human food; influences affecting character of milk; manufacture of condensed milk; the factory system and household plan of cheese-making; treatment of rennet; general process of cheese manufacture; subsequent treatment of cheese; butter-making; creameries; "deep" and "shallow" setting systems; general process of butter-making; packing and preserving butter.

DEPARTMENT OF BOTANY AND PRACTICAL HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest; also a course of lectures on Landscape Gardening. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard; fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture; shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in in the work of laying out and plotting grounds topographically.

CHEMICAL DEPARTMENT.

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life. Text-book, Ganot.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blowpipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

Are constantly in progress in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

DRILL IN ENGLISH.

"As grammar was made after language, so ought it to be taught after language."—*Herbert Spencer.*

Drill in English embraces the following topics:

Sounds of the language; drill in producing the vocal, sub-vocal and aspirate elements with accuracy, distinctness and volume; vowels, consonants.

Letters: Form; power; rules for spelling, drill.

Words: Signification, properties, modifications, variations, relation and dependence.

Sentences: Drill in statement of ideas; description, clearness, terseness, vigor; business letters, discussion; capitalization; syllabication; punctuation; construction and analysis of sentences; elements, uses and names; criticism of compositions printed as written; proof reading; grammatical construction; superfluous words and clauses; drill in reading, speaking and penmanship.

Text-books: Webster's Academic Dictionary; Lee & Hadley's Advanced Lessons in Language.

Pupils deficient in spelling, etc., should enter the printing class, the printing-office being the work-shop of language.

STRUCTURE OF ENGLISH.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

MATHEMATICAL DEPARTMENT.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

DRILL IN ARITHMETIC.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Following this line, the student, so far from hammering away at "pure" science draws from the mathematical store-house what he needs, and sees why he needs it. Accuracy of calculation and posting, rather than a *mere* comprehension of the principles, is aimed at. Besides the recitation-room drill in business forms, practice in the field is also given. Estimating the number of cords in a pile of wood said to be 100x4x4 feet is one thing; measuring a pile of wood through which any number of cats may be harmlessly thrown, and in which four-feet sticks are the exception, is quite another and more difficult thing.

ARITHMETIC AND BOOK-KEEPING

Is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides ensuring arithmetical practice, develops practical skill in that important art.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admiral system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study. In addition, constant practice in the application of lines to metal and wood is furnished in the Blacksmith, Carpenter, Turning, Scroll-sawing, Carving, Engraving and Printing shops, and to fabrics in the Sewing Department.

PRACTICAL GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the use of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

PRACTICAL SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

STUDIES SPECIAL TO WOMAN.

Besides the studies already indicated, attention is called to the following:

SPECIAL HYGIENE.

As shown in the course, one term is devoted to the study of Physiology, from the text-book of Dr. J. C. Dalton. This is followed in the fourth year by a course of lectures to young ladies by Mrs. Cripps on the subject of Hygiene, embracing such instruction in hygienic matters as are valuable to woman.

FARM ECONOMY considers those affairs of the farm which usually come under the supervision of the farmer's wife or daughter, and which are not included in "gardening" or "household economy;" such as butter and cheese-making, dairy management, etc. A course of lectures is delivered by the Professor of Practical Agriculture. See heading, "Farm Economy."

GARDENING is included in Practical Horticulture. See heading, "Landscape Gardening."

HOUSEHOLD CHEMISTRY. See heading, "Household Chemistry."

HOUSEHOLD ECONOMY

Follows Household Chemistry and consists of lectures by Mrs. Cripps on the art of house-keeping, embracing cookery, domestic management, and kindred topics. Many elderly gentlemen sufficiently know, and more young gentlemen will duly discover, that systematic knowledge of how cooking ought to be done is luminously different from the ability to do it. Instruction without practice can effect but little. Accordingly, a kitchen laboratory has been completely furnished, and affords every facility for drill in the art of cooking. This drill chiefly differs from that of a kitchen in the respect that after a girl has learned to wash dishes or pare potatoes she is not kept everlastingly at either. After full trial, we have found it just as feasible to give this practice, with profit and pleasure to the pupil, as it is to give laboratory practice in chemistry,—and no more expensive.

Printing!—Daily instruction and drill in the work of a First-Class Printer. The Literary Departments offer a thorough education in the construction and use of the English Language, as employed by the Proof-Reader; in Book-Keeping; and in Industrial Drawing, as the best developer of that taste necessarily exercised by every good Job Printer. The Printing Department is well furnished with all the facilities for a speedy mastery of the art of Printing, and is in charge of a practical printer. Besides regular class instruction in printing, the weekly publication of the INDUSTRIALIST by the Department furnishes advanced students the requisite drill in newspaper work.

THE INDUSTRIALIST

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THE INDUSTRIALIST.

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A National Training for the Young American.

The necessity of a sweeping reform in the principles and methods of our public school instruction is beginning to be widely recognized. The urgent appeals of Prof. Huxley are echoed on this side of the Atlantic, and public opinion will soon demand an adjustment of our scheme of education to the conditions and requirements of our time and country. We find the shortcomings of our present system, and their obvious remedies, pointed out with unusual clearness in a pamphlet lately issued by Mr. S. S. Boyce, who discussed the whole subject of industrial education with good sense and vigor.—*N. Y. Sun.*

"A sweeping reform,"—yes, a sweeping reform is what is being called for all over the country. The faults can be easily summed up in two allegations. There is too much expense attached to our system of public education and too little profit in it.

Other countries besides ours probably have not the best possible system of education, but we risk nothing in saying that ours is far worse than any of them. Our children are not trained in the least with any view to their natural capacities or any future calling in life. It does not seem ever to have occurred to our educators that all boys are not calculated to make lawyers and doctors, nor do they seem to recognize the fact that a man to enter the gospel field must be especially endowed. Thick-pated fellows are kept studying logic and rhetoric until they lose all taste for a spade or a plow-handle; and boys who might have made tolerable stone-masons or carpenters are ushered into the profession of law or medicine, only to disgrace it and become a bore to themselves and a nuisance to a community. But if our boys are being badly educated, the girls are being educated still worse. Life is not the dream of a theorist, but is a sad reality, even to those prepared to enter the conflict spurred and gloved. Our girls learn to play the piano. We can supply all the young men in the world with parlor wives who can play a few tunes tolerably well, but where are our young laboring men going to get wives who can wash their shirts and cook their victuals, those who will be positive "helpmates" according to the original design? Does a young man who expects to have to buffet the waves of life with his own bare exertion want to carry any dead weight? We should think not, and if he takes a partner he wants one fitted to the position she is destined to fill, one who can bring the sweetest kind of tunes out of a wash-board, and with a little flour can draw a loaf of bread so natural that her husband, if he made up his mind every morning to desert her, would always be sure to come back at dinner-time. Every way our public schools are impositions upon the tax-payers, and such is decided to be the case all over the country. A set of theorizing educators have got control of the public schools, in towns especially, and a boy or girl has to be run through their routine mill six or seven years, may be eight or ten, to acquire the elements of an education, all of which they ought to acquire in one-fourth of the time; but in the meantime the tax-payers bleed at every pore. Talk about rings, the educational ring in our public-school department is the very worst we have to deal with.—*Parsons Eclipse.*

CHARLES CLEMMER has on his farm, two miles west of this city, we believe, the finest vineyard in the county, two acres, containing 1,000 thrifty, bearing vines, now loaded with the most luscious fruit. Our farmers would do well to give grape-raising more attention.—*Independence Kansan.*

Vacation.

The school-boy or girl gladly accepts this proffered season of rest. To them it is suggestive of green fields, and hillsides, and orchards, and the breath of clover, and the new-mown hay. It suggests fishing and bathing and boating. Every thought of it is a pleasure, and pleasure is in every thought and promised action. How is it with you, teacher? Do you anticipate it with the same feeling of joy that your pupil does? If you do, it is well with your school and with you. If you do not, and there is a continuance of your labor in any other sphere, outraged nature will cry out against you and punish you and yours.

To the pupil, vacation means pleasure; to the teacher, it means rest. A vocation whose labors have been aptly compared in intensity with that of the mine or forge, cannot be continued without these annual periods of rest.

See, then, that you do rest. Not in the gilded halls of fashionable summer resorts, not in the giddy whirl of questionable amusements, not by laying down Latin and taking up Greek,—but by quiet, passive, indolent, if you please, actions and movements. Do not arouse the mind to continuous activity, as in school times. "Take no thought for the morrow" in school matters, while you are in vacation's glories, for surely the school morrow will take thought for the things of itself. If you do this, if your rest is recuperative, your power will come again as Samson's growing locks brought him the power he lost.—*Eldorado Times.*

THE Yellowstone Geysers are the most remarkable in the world. There are more than 10,000 vents. The Grand Geyser throws a column of water six feet in diameter 200 feet high, while the stream ascends 1,000 feet. Its eruptions occur every 24 hours and continue 20 minutes. The Giantess throws a stream 20 feet in diameter, 60 feet high, and through this five or six smaller jets 250 feet high. It plays 20 minutes once in 11 hours. The Giant sends up a five foot column 140 feet high for three hours. The Beehive projects a column three feet in diameter to the enormous hight of 219 feet for about 15 minutes. Old Faithful, very regular for 15 minutes once an hour, sends up its massive column six feet in diameter 100 to 150 feet high.—*Exchange.*

FIRST Assistant Postmaster General Tyner, who recently passed through Kansas, has got back to Washington, and appears to be enthusiastic over this State. He told a reporter that the tide of immigration into Kansas had never before been equaled in the history of an American State. He thinks Kansas will become one of the great States of the Union, like Ohio, Indiana and Illinois. It is more than twice as large as Ohio, and if as densely populated could support 7,000,000 of people. As to the negro exodus into Kansas, he says it is but a drop in the bucket and that an equal number of white men going there would have attracted no attention whatever.—*Exchange.*

THE exports from New York last week were valued at $7,765,809, and were the largest of the year. The shipments to Liverpool were over a million and a quarter, and to London over a million. Included in the total were 2,118,309 bushels of wheat, 461,468 bushels of Indian corn, 38,473 barrels of wheat flour, 4,408 bales of cotton, 11,557,612 gallons of petroleum, 9,154,929 pounds of cut meats, 515,823 pounds butter, 4,999,641 pounds cheese, 6,193,675 pounds lard, 943,490 pounds tallow, 1,751 hogsheads and 699 pounds tobacco, 167,523 pounds manufactured tobacco and 951 bales of hops.—*Champion.*

Our Exchanges.

Immense quantities of pressed hay are being shipped from here to points in Colorado and New Mexico, where it brings better prices.—*Hutchinson Herald.*

The experiment of industrial education is being tried in the Indian school at Yankton (Dakota) agency. The boys are being instructed in various trades, and have shown considerable interest.—*Exchange.*

Kansas now ranks, in railroad mileage, as the twelfth State in the Union. In 1864 there were 40 miles of railway in this State; in 1870 there were 1,501 miles; in 1876 there were 2,238 miles; and in March, 1879, there were 2,443½ miles. The aggregate, at the close of the present year, will be 3,000 miles.—*Exchange.*

During the year ending March 1st, 1879, 15,952 farm dwellings were erected in Kansas, having an aggregate value of $2,082,053. Osborne county heads this list, having erected 731 farm buildings during the year; Mitchell county ranks next, with 728; Barton next, 669; Rush next, with 571; and Lincoln next, with 563.—*Beloit Gazette.*

It is not good luck that makes good crops, but it is good work. Some farmers always have good crops, good stock, and get good prices. It is because whatever they put their hand to they do well. They have clean fields, good fences, and do good plowing, cultivating and seeding. They farm with brains as well as hands. If other farmers would imitate their example, they would have better crops.—*Rural World.*

Good Advice to Readers.

If you measure the value of study by the insight you get into subjects, not by the power of saying you have read many books, you will soon perceive that no time is so badly saved as that which is saved in getting through a book in a hurry. For if to the time you have given you had added a little more, the subject would have been fixed on your mind, and the whole time profitably employed; whereas, upon your present arrangement, because you would not give a little more, you have lost all. Besides, this is overlooked by rapid and superficial readers—that the best way of reading books with rapidity is to acquire that habit of severe attention to what they contain that perpetually confines the mind to the single object it has in view. When you have read enough to have acquired the habit of reading without suffering your mind to wander, and when you can bring to bear upon your subject a great share of previous knowledge, you may then read with rapidity. Before that, as you have taken the wrong road, the faster you proceed the more you will be sure to err.—*Sydney Smith.*

CATTLE-GROWING in the United States is yet in its merest infancy. It has received scarcely any study. There are features connected with the export trade, which is growing so wonderfully, that will "bring it out." Foreign markets require the very best qualities of beeves. Cattle farmers are learning to guide themselves accordingly. They know that buyers pay much higher in proportion for steers of 1,600 pounds average than for those of 1,000 pounds. They will next discover that they must have not only fat cattle but improved breeds, in order to insure their raising to be a money-making business. When this time has arrived, the cattle interest will hardly be second to any in the land. The diversities of climate and the different kinds of herbage to be found, render this country the most favorable of any on the globe for the cultivation of all the best varieties of cattle which centuries of scientific and assiduous breeding and improvement in Europe have produced.—*Walnut Valley Times.*

THE INDUSTRIALIST.

SATURDAY, AUGUST 23, 1879.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

THE Fall Term of the Agricultural College begins Wednesday, September 10th, 1879, and closes December 18th, 1879.

THE National Agricultural Congress will hold its semi-annual meeting at Rochester, N. Y., on the 15th of September, at the same time that the American Pomological Society holds its meeting. This will enable the members and friends of both societies to attend both meetings without additional cost.

Notes by the Way.

Owosso, Mich., Aug. 18th, 1879.

During my recent journey to this place, I had many evidences of the great war now raging among the railroads focusing at Kansas City. At the latter place we were offered first-class tickets to St. Louis at the nominal price, $8.50; but at St. Louis the $8.00 were returned to the ticket-holder, thus it would seem effectually heading off the scalpers and giving the traveler a ride of two hundred and eighty miles, or thereabouts, for fifty cents.

But what interested and delighted me most was the substantial improvements—in the way of ease and comfort in traveling—which this "war" has forced the companies to adopt. Luxuriously upholstered reclining chairs, in cars whose elegance suggests the drawing-room rather than the vehicle, are the rule on all through trains. Improvements of this kind, we apprehend, are the real gains to the traveling public from these wars; for, while fifty-cent fares to St. Louis will certainly not last longer than a few days, these comforts and conveniences become permanent features on the road which adopts them. A conductor assured me that not a half-dozen persons occupied the sleeper attached to his train, a fact which I know will delight every one who has been squeezed by the Pullman monopoly to the extent of $2, for the use of a berth in its cars. I saw

KANSAS PEOPLE

everywhere, and it seemed as though every one was talking of Kansas and its wonderful productions. If Mr. Kansan was going East, he bore himself like a man in easy circumstances, who felt a good deal of contempt for the country through which he was passing. If the gentleman was westward bound with his family, to occupy the "claim" he had taken some months previously, his looks and demeanor were those of a man who had "struck it big" and knew it.

On boarding the cars at Quincy, I met Mr. Lea, the veteran editor, business man, and now postmaster of Columbus, Cherokee county. Mr. L. is an indefatigable worker and a genial gentleman; and the way he distributed real estate documents and talked Kansas in general and his own locality in particular, leads me to believe that Cherokee will do well to keep Mr. Lea before the people. Shortly afterwards I met a Kansan of twenty years' standing, an old free soiler, and now a

PROMINENT POLITICIAN,

with whom I journeyed for six or seven hundred miles, and from whom I parted with many regrets. The INDUSTRIALIST is not political, and I shall not mention names; but from this eloquent gentleman I had more or less all of the intrigues, bargains, sales and schisms of recent Kansas political history. Some day all this will be written, and when the book appears it will at once take rank with Pepy's Diary and Grenville's Memoirs, and will be more interesting than either.

Since leaving Manhattan I have had a considerable experience with

HOTEL FARE,

and I feel free to say that my disgust with the mysterious mixtures called food, which are placed before the hungry traveler, has increased with my knowledge of the subject. American potatoes are the best in the world, and thoughtless persons might suppose that they were eaten because they were potatoes. But not so does the cook think. If the potatoes are to be fried, they are first mixed with several sorts of grease; and, after stirring them over the fire until the grease is thoroughly incorporated with the vegetables, they are ready for the table. Here they are expected to be smothered in salt and pepper and then drowned in that just object of suspicion which we call gravy. Voltaire, in his biting way, once said that the English were "a people with four hundred religions and only one kind of gravy." In saying this he paid British cooks a mighty compliment, and one that could only be surpassed by saying that they had no gravy at all.

What I have said of potatoes applies to many other articles. Puddings, however excellent, are worthless until they have been deluged in a vile mixture made up of butter, sugar and flavorings, the whole in taste, smell and appearance closely resembling pomade. Let every article be properly seasoned say I, but above all let it retain its individuality, for when this is once lost the substance must be labeled "hash." I trust the young ladies in Mrs. Cripps' cooking class will take these remarks in the kindly spirit in which they are given.

THE DROUTH.

This county, and I judge a large portion of the State, is now suffering from a protracted drouth which was hardly surpassed by our Kansas experience of 1874. Everywhere you see evidences of the scourge. The air is full of dust, and the crops are parched and stunted, corn and hay and oats being an almost entire failure. To add to the mischief, stinging frosts were had here on the nights of the 15th and 16th, which have done great damage. If all this had happened in Kansas, "drouthy Kansas" would have been howled to the uttermost ends of the earth, and the wiseacres would have read us mournful lectures on the supreme folly of attempting to settle the "Great American Desert." This is the penalty we pay for being the best-advertised State. Michigan will not suffer seriously from this scourge because it is an old-settled State and its people are forehanded. In like manner Kansas drouths will be heard of no more when Kansas people have passed the pioneer stage of growth. Drouth and grasshoppers are the measles and whooping cough of infancy. Adults are not generally injured by them.

In another letter I shall have something to say of the Short-horns of those parts of which I expect to see something this week.

E. M. SHELTON.

The "Ark" Heard From.

EUREKA, Kas., Aug. 18th, 1879.

Dear Industrialist:—The occupants of the "Ark" are having a tip-top time. The second day out we passed through Council Grove, and met several friends whose acquaintance we made at the Musical Convention last June. The boys shot five prairie chickens that day. John Mann knew how to serve them up in good style, and we satiated our ravenous appetites upon the game, eating three for dinner and two for supper. The next day (Thursday) was not so funny, because it rained nearly all day. We made about twenty miles, however, passing through Americus and Emporia. Mark Reeve stopped off at Americus; and as the weather was not very favorable for camping, a friend of Mark's, Mrs. Hill, set us up a splendid dinner.

Emporia is a lively town. The streets were full of people who seemed to be on business of one sort or another. Judging from the number of saloons on the main business street, and from the appearance of some of the men on the street, I think Emporia needs another temperance revival. Morris county, the second below Riley, is a herd-law county; Lyon is not: and as we compared the farms, the buildings, and the improvements of the country in general, in the two counties, as far as thrift and enterprise was concerned, the verdict was not in favor of a herd law. The corn crop in the valley of the Neosho is simply immense.

Friday was a fine day, and we had a delightful ride to Madison, on the Verdigris, twenty miles south of Emporia. Here we spent the night with our friend and graduate, Albert Godfrey, who seems to be living in a large share of domestic felicity with his "helpmeet" (Miss Stella Bouton). They entertained us right royally. Mrs. Godfrey treated us to splendid apple dumplings, which she had learned to cook after the most approved style in the culinary department of the College. Godfrey is one of our graduates who is certainly a practical "Kansas farmer." He showed us his corn-field, his vineyard of three or four hundred vines loaded with delicious fruit (of which we partook heartily), and his orchard of nearly a thousand apple-trees (many of them just coming into bearing and yielding last year over five hundred bushels), and peach and cherry trees without number. He also showed us his building site, where he proposes to build; and he says if we will come again in four or five years, he will show us things fixed up in "ship-shape." Success to him.

Saturday was a lovely day, and we enjoyed our ride hugely—thirty miles farther south to Eureka; but, although the boys looked sharp, they "didn't see nary chicken the whole blessed day." This was a great trial to them, but may be they will make it up this afternoon, as they are now off on a hunt across Fall River. The A., T. & S. F. R. R. Co. have just built a branch road from Emporia to this place, which enlivens business here considerably. The road is pushing on still farther south. Eureka is a nice, thriving town of a thousand people, intelligent and enterprising; but I am sorry to say they have elected city officers who have just licensed three saloons to deal out liquid poison to the inhabitants. O rum! when will thy cruel reign be o'er!

The country between Emporia and this place is a fine, gently-rolling prairie, traversed by several pretty streams, which wend their way to the Neosho. It is very little settled, except along the streams, as this land was brought into market nearly twenty years ago, and was bought up largely by eastern speculators, who have held it at such high figures that settlers would not buy while there was so much land farther west to be taken under the homestead act. This has been a great drawback to the settlement of Greenwood county, but now that the cars are whizzing through it, probably much of it will be bought by settlers.

We start on our return trip to-morrow, by way of Burlington and Burlingame. I must tell the rest when I reach home.

Yours, etc., J. E. PLATT.

THE INDUSTRIALIST.

SATURDAY, AUGUST 23, 1879.

Instead of the usual circular or catalogue, we send the Industrialist to those desiring information about the Kansas State Agricultural College. We would call attention to the articles headed "Departments of Instruction," "Industrial Education," "Special Advantages," and "Directions to Applicants." If further information is desired, address Agricultural College, Manhattan, Kansas.

Those intending to take boarders next term, or who have rooms to rent, either furnished or unfurnished, are requested to notify Prof. Ward or A. A. Stewart of the fact.

The old Boarding Hall has been rented to Mr. Viles, who has contracted to furnish gentlemen students plain, table board at $1.50 per week. Unfurnished rooms, accommodating from two to four persons, at $1.50 a room per month. Those desiring to board themselves can obtain rooms in the old College building.

We have frequent applications, from young ladies and gentlemen in distant parts of the State, for situations in families, where they can pay their board, in whole or in part, by work, while attending College. Families in town, or in the immediate vicinity, desiring such help, are requested to communicate with Prof. Ward.

District boards about to issue school bonds are invited to correspond with us before negotiating elsewhere. We pay par for first-class 7 per cent bonds, issued upon our blanks. Bonds drawn on our blanks are not transferable, and hence may be safely sent by mail at letter postage. Blanks furnished free of charge on application to M. L. Ward, Loan Commissioner.

The old Boarding Hall is being repaired.

It is reported here that W. C. Stewart's little son Earl is dangerously ill.

George Rose went down to Bismarck this morning to be electrified by the temperance enthusiasm which prevails there.

Mr. Thompson's letter will appear next week (if we get it), and we hope to hear from Mr. Salter in time for the week following.

Prof. Failyer and wife returned from the mountains Thursday. George bears the honors of a married man with dignity and complacency.

W. A. Sternberg, the popular freight agent at Wilson, and well known to old students, was one of the many visitors to the College this week.

Miss May Campbell is to have charge of the primary department of the Randolph public school during the coming year. Miss Emma will teach in the Christensen district, north of Manhattan.

Mr. Schoonmaker's lecture, which was advertised for next Wednesday night, has been indefinitely postponed. The lecturer was unexpectedly called to Kansas City, and thus forced to cancel several appointments.

President Anderson and wife returned from the East last Saturday. They spent two days in Manhattan this week, shaking hands with their many friends. It seems like old times to see such familiar faces on College Hill.

George Perry has gone to Washburn College, a Congregational institution at Topeka. He has obtained employment there which will last until the term begins, when he will enter that College and take the classical course.

Prof. Shelton's interesting letter was accompanied by the following appropriate note: "The above was mostly written on the 'kears.' I trust the intelligent compositor will not indulge in any undue profanity in setting it up."

On Wednesday last Mr. George Buell and Miss Ella Abbott were united in the bonds of holy wedlock. Mr. Buell is a brother of C. S. and Delight Buell, and Miss Abbott was one of our last-year students. We hear more wedding bells in the distance. Such is life.

During our visit to Bismarck Grove this week we were pleased to meet several old students. Among these were the Copley boys of Medina, Jefferson county, and Miss Nina Garrett, of Wyandotte. The Messrs. Copley talk strongly of returning to College this fall.

The Manhattan Cornet Band has been reorganized. Two hundred and forty-five dollars have been raised with which to purchase new instruments. The *Enterprise* says that "first-class, silver-mounted horns have been ordered, and the band, with its new uniforms, drum major, etc., will make a finer appearance than any in the State."

A letter was received from S. M. Morgan on Wednesday announcing the death of his father, who has been sick so long. This sad bereavement, Mr. Morgan says, will prevent his return to College this fall; but he promises to make us a short visit in September. We extend him the sincere sympathies of the Faculty and students in this great loss.

GOOD WORDS FROM PROF. VAN DEMAN.

GENEVA, Kas., Aug. 13th, 1879.

Dear Friends and Readers of the Industrialist:—It might be of interest to some of you to tell what we are doing in Allen county during vacation. Wirt Myers has been selling books, and is the only one of the students that I have seen lately. There are a number of persons talking of going from this and adjoining counties to the College the next year.

Since last May I have been busy at work on my farm here at Geneva. We have no fruit except grapes and a very few apples. It is time to bud peaches now, if it has rained in your locality recently, so that the young peach seedlings are in a thrifty condition. If any of the old students wish some good peach buds, and will send me notice and stamps to pay postage on them, I will forward them a few free of charge, as I have many of the earliest and latest kinds known.

As soon as I can do so I shall visit the College, and hope to see many of the old faces. It is my conviction that to get a common-sense, practical education, the Kansas Agricultural College is the best place I have seen.

Yours, fraternally,

H. E. VAN DEMAN.

RELIEF FOR THOSE ON THE "QUI VIVE."

GRANTVILLE, Kas., August 18th, 1879.

Editors Industrialist:—The INDUSTRIALIST of last week announced to its many readers that they should "hear" from me. No doubt all are on the *qui vive* to hear what I have to say. Lend me your ears. I have too much to write to permit it being published in your paper. Everybody knows that you have a large corps of correspondents; and unless the articles are thoroughly "boiled down," owing to the smallness of the sheet, the "devil and (his) types" could find no room for locals. Now, if you take away the occupation of the devil, why—! (Here the reader is supposed to imagine something.)

I have read "Darwin's" letter from Topeka, and what he there mentioned could be fitly said of this town. Its "thriving condition" bids fair to not become, etc., etc. The "public edifices" are "worthy of no special notice, although the erection of them is only a *question of time*." Really, Mr. Leach must allow me to congratulate him, for his letter is quite interesting, and his account of Topeka as true as though I had written it myself.

Well, since last Commencement I have been a "horny-fisted son of toil." I have labored hard, for me, and that is all I shall say. Have studied none, and do not expect to until I have more time. I meet many of the old students. Leach I see frequently in Topeka; and Williamson is there. Mr. Reed I saw yesterday on his way to Bismarck.

I presume there will be a good attendance at the College this fall. So mote it be. I wish every day of my life I was yet a second-year student. I wonder that none of the class of '79 have written you. Eckman should write, because I heard that he was in the printing-office of his brother-in-law, "playing the devil." Unseemly conduct, Mr. Eckman. Please explain. Salter might tell of his new barn; Blain, of his success in surveying that Plat(t) near Wabaunsee. Sikes could write of—anything he wanted to. Wood might tell of our Alumni, in a short letter. Reed should tell of those Holton "school marms." The ladies, especially, should be heard from.

I take this opportunity of extending my compliments to all students. Mr. Thompson, next.

As ever, HARRY C. RUSHMORE.

NATIONALIST ITEMS.

The public school will commence Monday, September 1st.

Bicycles are becoming quite popular, in our city, as a source of recreation and amusement.

Probably the most costly monument in the cemetery has just been erected to the memory of Mrs. Bradley.

Chas. McConnell is writing up a very neat and complete set of Abstract of Title books for Sam Kimble, Jr.

The last census of school children between the ages of five and twenty-one, foot up 700. The census last year shows 575. Quite an increase.

There will be the largest docket at the next term of the District Court that there has been for several terms past. Mostly appeal cases.

The shelves are being put in Mr. Fox's new building, and a cut-stone pavement is being laid in front of the door. He will move in sometime next week.

The fall term of the College at Manhattan will begin on Wednesday, Sept. 10th, and the officers are sending out that bright little INDUSTRIALIST as a source of information. It is the neatest-printed paper in the State, and if every branch of the school is as thoroughly managed as is the printing department, no young man seeking a practical education should fail to attend that school.—*Beloit Gazette.*

Mr. Jas. C. Stone, Jr., of Leavenworth, Kan., brother to Mr. Samuel H. Stone, of this county, is here in the interest of his herd, and has bought of parties in Clark and Bourbon twenty thoroughbred Short-horn heifers, to be shipped in a few weeks. Mr. Stone is a fine judge of cattle, and has selected a choice lot. But few men in Kansas, if any, can compete with him.—*Richmond* (Ky.) *Register.*

The Board of Regents of the Agricultural College have not yet found a man to fill John A. Anderson's position as President. Mr. Anderson took charge of that school when it was nearly at a point of being declared a failure. He built it up; and when he resigned to take his seat in Congress, it was the most prosperous educational institution in the State.—*Beloit Gazette.*

DIRECTIONS TO APPLICANTS.

TERMS OF ADMISSION.

Candidates for admission must be fourteen years of age, and pass a satisfactory examination in reading; arithmetic, through decimal fractions; and English grammar, to syntax. Classes are started at the beginning of each year in Drill in Arithmetic and Drill in English; and the pupil must have the knowledge above indicated, else he will be unable to retain position if admitted.

Pupils will be received at any time during the year, if able to pass an additional examination upon the subjects studied by the classes which they expect to enter. But they will find it greatly to their advantage to be present at the opening of each term, or as soon thereafter as possible.

GRADES.

Both the Literary and Industrial recitations are graded daily upon a scale of 100; and an examination of all classes is made at the close of each month. A student not attaining an average grade of sixty is promptly dropped to a lower class, or excluded from the Institution until able to do so. The work of grading is strict and uniform in all the departments, and this process is rigorously used for sifting out incompetent and indolent pupils; thus more than accomplishing all that is designed to be effected by a "high standard of admission." Hence, the student's continuance in the College wholly depends upon his own action.

The course is based upon the determination to make the labor required in the preparation of one industrial and three literary recitations as much as the average student can perfectly perform, in ten hours a day. We design to give the pupil the worth of the time expended at College; and, in order thereto, he must do a full day's work with brain or hand. Only those students who can maintain a standing of ninety in each study will be allowed to take more than the prescribed number of recitations; and no one will be permitted to have less than one industrial and three literary recitations.

RELIGIOUS.

Unless otherwise directed by parents, students are required to attend chapel at 8:30 A. M. on academic days, and divine service once every Sabbath.

EXPENSES.

There are no charges whatever for enrollment, attendance or instruction in the regular courses; nor are there any "contingent fees" for the repair of buildings, for the use of books or apparatus, for diplomas, or the kindred privileges usually grouped under the term "contingent." Male students are furnished instruction, the use of apparatus, instruments or tools, in both the literary and industrial classes marked out for them, without any charge. And the same is true of female students in the regular classes provided for them. Printing and Telegraphy are industrials primarily provided for the education of female students, and male students taking either of these are charged $1 per month for use of instruments.

Instrumental music is a fine art or "accomplishment," rather than a mechanical art. We do not place it among our "industrials" in the same sense, or for the same purpose, that we do those provided for teaching the trades. Accordingly, the following fee is required from female students for tuition and the use of instruments:

Terms per week:

Private lessons, 2 a week, on any instrument, $1.00
Private lessons, 1 a week, on any instrument, .60
Class lessons, 2 a week, on any instrument, .65

Instruction in harmony, etc., etc., from ten to fifty cents per week, as the student may or may not be in other classes.

The only charge made for material in either the literary or industrial departments is for the chemicals used by students in laboratory practice, which are furnished at wholesale prices, and amount to but a small sum.

Furnishing an absolutely free education is as much as can be reasonably asked; and the Institution neither boards, clothes, nor supplies the student with text-books. Boarding can be obtained in private families at from $2.75 to $4 per week. Washing costs from seventy-five cents to one dollar per dozen. Text-books, which can be procured in Manhattan, cost from $2 to $5 per term.

No student need expend over $5 per week; and many of our best pupils are living at $1.25 per week. Students desiring to "board themselves" can do so at from $1 to $2 per week. In a club of four young men, renting a house, the average cost to each for the term was $1.11 per week.

LABOR.

Manual labor by the students may be for either of two purposes: First, to acquire skill in a given art; second, to earn money. In the first case, the labor is educational; in the second, it should be paid for by the party benefited.

Educational Labor.—Manual labor in the recitations of the Industrial Departments, like mental labor in those of the Literary Departments, is purely educational and will not be remunerated. While the interest of the student will be held paramount in the direction of this labor, the practice necessary to dexterity will be required.

Remunerated Labor.—When the Institution needs labor on the Farm or elsewhere which is not educational, but simply for its own profit, and which a student is able and willing to perform, it becomes an employer instead of a teacher, and he an employe instead of a scholar. It pays for work, he works for pay. The relation between them is commercial, not educational; and both parties must act upon business principles. Hence, the College furnishes only such employment as its own interests require, and will pay according to the value of the service rendered at from seven to ten cents an hour.

AMOUNT EARNED.

It is impossible to predict how much a given person can earn, since that depends upon what he can do and what work there is to be done. Hence, it is wholly impossible for us to answer the question so often asked: "Do you think I can meet my expenses by work?" Some students make one-half their expenses, some the whole, and exceptional men have made more than expenses. As a rule, a faithful boy skilled in farm work can earn half his expenses on the Farm or in the Nursery. During the year he can ordinarily acquire sufficient skill in the wood or iron shops to enable him to make articles for sale. The whole question is one for his own consideration and decision. We can teach all who come, but cannot absolutely *promise* anything more. Hitherto we have refrained from holding out strong inducements respecting the amount of labor we might have to offer; but in view of the fact that during each of the last three years we have had more to do than the students could perform, we are inclined to give greater and positive encouragement on this point. Any boy who is in dead earnest, who is familiar with farm operations, and who can raise $50 to start with, should be able to carry himself through the four years' course. And certainly this places an education within the reach of every determined boy. As yet we are unable to offer similar advantages to girls, not requiring labor in the College departments which they can perform.

RULES.

1. Behave as a true man or woman should, at all times and in all places.

2. Attend to your own business promptly, thoroughly and courteously; and vigorously let alone that of other people.

3. Penalty: "Leave!"

PUBLICATIONS.

The "Hand-Book," published in 1874, containing a full discussion of the educational question and the aims of the Institution, will be forwarded to any one desiring it.

THE INDUSTRIALIST, a weekly journal edited by the Faculty and published by the Printing Department, contains original and seasonable articles on the Farm, Orchard, Trades, Sciences, and Education. Price, 75 cents a year. Address A. A. Stewart, Manhattan.

CALENDAR.

Fall Term, 1879.—Will begin Wednesday, September 10th, 1879, and close December 18th, 1879.

TO NEW STUDENTS.

Bring the text-books you have been using. On arrival, first arrange for your boarding. A. A. Stewart will furnish information, either by letter or on application, concerning boarding places or rooms for rent. Report to the President at 8:30 A. M., immediately after chapel exercises, for enrollment.

For further information apply to Jno. A. Anderson, President, Manhattan, Kansas.

RAILROAD TIME-TABLE.

KANSAS PACIFIC RAILWAY.

PASSENGER ARRIVES.

No. 2, going East	11:58 A. M.
No. 4, going East	3:28 A. M.
No. 1, going West	4:03 P. M.
No. 3, going West	4:51 A. M.
No. 7 (freight), going West	8:45 A. M.

Nos. 1, 2 and 7 run daily. No. 3 runs daily except Monday. No. 4 runs daily except Sunday. Passengers with tickets are carried on No. 7.

GEO. C. WILDER, Agent.

THE INDUSTRIALIST.

SATURDAY, AUGUST 23, 1879.

Industrial Education.

The real value of an education to the student depends upon two things: First, the practical worth of the knowledge taught; and, second, the degree in which he makes it his own. Hence, the ability of any institution to give a practical education depends upon the kind and aim of the knowledge it teaches, and upon the thoroughness of the instruction therein. The State Agricultural College was directly endowed by Congress, and is guided by the State, for the specific purpose of furnishing to the industrial classes of Kansas a "practical" education, that is, "one fit for use." As its name indicates, and as the statistics of the industries of the State require, its chief work must be that of giving a useful and usable education to those who will engage in farming; and, therefore, the Farmer's Course must, from the nature of the case, be its main one.

FARMER'S EDUCATION.

Words and figures are merely instruments with which to record ideas. They are not themselves ideas, nor should they be made the chief end of an education. As a wagon is necessary to haul grain, so are they a necessary part of an education; but as the wagon is not the grain, so they are not the knowledge which the farmer converts into money. Hence, the classics and higher mathematics are not taught. But it will be noticed in the following course that so soon as the pupil acquires working skill in the use of the English language as a tool, and of figures and lines as mathematical tools, those arts and sciences which present knowledge that has a cash value to the farmer are taught as rapidly as their importance and thorough acquisition will permit. Studies numbered (1) and (4) in the second, third and fourth years are the spine of the course, to which the others are as ribs and muscle.

FARMER'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Practical Agriculture (advanced.)		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	1. Drill in English.
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	2. Drill in Arithmetic.
3. Polit. Economy, Practical Law.		3. Practical Geometry.		3. Algebra.		3. Industrial Drawing.	3. Industrial Drawing.
4. Zoology.		4. Horticul., Landscape Gardening.		4. Practical Agricul. (elementary).		4. English Structure.	4. English Structure.
5. Agricul. Chemistry Meteorology.		5. Organic, Analytical Chemistry.		5. Physics.		5. Adv'd Arithmetic, Book-keeping.	5. Adv'd Arithmetic, Book-keeping.
6. Logic.		6. Practical Surveying.		6. Industrial Drawing.		6. U.S. History, Industrial Drawing.	6. U.S. History, Industrial Drawing.

WOMAN'S EDUCATION.

Nearly one-half of our students are females, and the Woman's Course is prepared expressly for their liberal and practical education. We have no doubt whatever that practical men and women, who understand what it means and what it seeks to do, will fully endorse it.

WOMAN'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Farm Economy, Special Hygiene.		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	1. Drill in English.
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	2. Drill in Arithmetic.
3. Polit'l Economy, Practical Law.		3. Industrial Drawing.		3. Algebra.		3. Industrial Drawing.	3. Industrial Drawing.
4. Zoology.		4. Horticul., Landscape Gardening.		4. English Literature.		4. English Structure.	4. English Structure.
5. Phys'c'l Geography, Meteorology.		5. Organic, Household Chemistry.		5. Physics.		5. Adv'd Arith., Book-keeping.	5. Adv'd Arithmetic, Book-keeping.
6. Logic.		6. Household Economy.		6. Industrial Drawing.		6. U.S. History, Industrial Drawing.	6. U.S. History, Industrial Drawing.

MECHANIC'S EDUCATION.

Because of the adaptedness of the leading course to the wants of the intelligent mechanic, it has been found practically unnecessary to diverge from the Farmer's Course. Additional studies, specially adapted to the mechanic's use, will be furnished in a Post-Graduate's Course.

If it be urged that the distinctively agricultural knowledge taught in the Farmer's Course is not directly valuable to the mechanic, we reply that, admitting the point for the purpose of argument, yet: 1. This knowledge is of more practical value to the mechanic than is the Latin, Greek, or a half dozen other things embraced in the usual course preparatory to the professions; 2. That the great majority of Kansas mechanics will also be more or less engaged in agriculture; 3. That those studies in the course which are directly valuable to the mechanic, together with the shop facilities, offer a better mechanic's education than can be elsewhere found west of the Alleghanies.

INDUSTRIAL DEPARTMENTS.

Having knowledge in the head is one thing; ability to use it with the tongue, fingers or feet is quite another thing. Both are vital to success in practical life. A man might thoroughly understand the theoretical principles of carpentry, and yet, not having used the tools, be wholly unable to earn carpenter's wages. So in all other vocations. Accordingly, instruction is given in the following well-equipped Industrial Departments, and every student is required to recite in some one of them, as selected by the pupil or parent:

FOR MALE STUDENTS.	FOR FEMALE STUDENTS.
The Farm.	Dress-making.
The Nursery.	Printing.
Carpentry.	Telegraphy.
Cabinet-making.	Scroll-sawing.
Turning.	Carving.
Wagon-making.	Engraving.
Painting.	Photography.
Blacksmithing.	Instrumental Music.

Each of these departments is conducted exactly as in daily life, and aims to give precisely the drill received by an apprentice. No charge is made, either for tuition or material, from male students taking the Industrials provided for them; nor from female students taking the ones provided for them, except in Instrumental Music. Male students taking either Printing or Telegraphy are charged $1.00 per month for the use of instruments and material.

DEPARTMENTS OF INSTRUCTION.

DEPARTMENT OF AGRICULTURE.

PRACTICAL AGRICULTURE.

Second Year:—General principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage.

Fourth Year: General view of agriculture, an cient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; genera advantages of a rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farmhouses; barns.

FARM ECONOMY.

Woman's Course, Fourth Year: Dairy products as human food; influences affecting character of milk; manufacture of condensed milk; the factory system and household plan of cheese-making; treatment of rennet; general process of cheese manufacture; subsequent treatment of cheese; butter-making; creameries; "deep" and "shallow" setting systems; general process of butter-making; packing and preserving butter.

DEPARTMENT OF BOTANY AND PRACTICAL HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest; also a course of lectures on Landscape Gardening. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard; fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture; shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in in the work of laying out and plotting grounds topographically.

CHEMICAL DEPARTMENT.

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life. Text-book, Ganot.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blowpipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

Are constantly in progress in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

DRILL IN ENGLISH.

"As grammar was made after language, so ought it to be taught after language."—*Herbert Spencer.*

Drill in English embraces the following topics:

Sounds of the language; drill in producing the vocal, sub-vocal and aspirate elements with accuracy, distinctness and volume; vowels, consonants.

Letters: Form; power; rules for spelling, drill.

Words: Signification, properties, modifications, variations, relation and dependence.

Sentences: Drill in statement of ideas; description, clearness, terseness, vigor; business letters, discussion; capitalization; syllabication; punctuation; construction and analysis of sentences; elements, uses and names; criticism of compositions printed as written; proof reading; grammatical construction; superfluous words and clauses; drill in reading, speaking and penmanship.

Text-books: Webster's Academic Dictionary; Lee & Hadley's Advanced Lessons in Language.

Pupils deficient in spelling, etc., should enter the printing class, the printing-office being the work-shop of language.

STRUCTURE OF ENGLISH.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

MATHEMATICAL DEPARTMENT.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

DRILL IN ARITHMETIC.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Following this line, the student, so far from hammering away at "pure" science draws from the mathematical store-house what he needs, and sees why he needs it. Accuracy of calculation and posting, rather than a *mere* comprehension of the principles, is aimed at. Besides the recitation-room drill in business forms, practice in the field is also given. Estimating the number of cords in a pile of wood said to be 100x4x4 feet is one thing; measuring a pile of wood through which any number of cats may be harmlessly thrown, and in which four-feet sticks are the exception, is quite another and more difficult thing.

ARITHMETIC AND BOOK-KEEPING

Is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides ensuring arithmetical practice, develops practical skill in that important art.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admiral system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study. In addition, constant practice in the application of lines to metal and wood is furnished in the Blacksmith, Carpenter, Turning, Scroll-sawing, Carving, Engraving and Printing shops, and to fabrics in the Sewing Department.

PRACTICAL GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the use of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

PRACTICAL SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

STUDIES SPECIAL TO WOMAN.

Besides the studies already indicated, attention is called to the following:

SPECIAL HYGIENE.

As shown in the course, one term is devoted to the study of Physiology, from the text-book of Dr. J. C. Dalton. This is followed in the fourth year by a course of lectures to young ladies by Mrs. Cripps on the subject of Hygiene, embracing such instruction in hygienic matters as are valuable to woman.

FARM ECONOMY considers those affairs of the farm which usually come under the supervision of the farmer's wife or daughter, and which are not included in "gardening" or "household economy;" such as butter and cheese-making, dairy management, etc. A course of lectures is delivered by the Professor of Practical Agriculture. See heading, "Farm Economy."

GARDENING is included in Practical Horticulture. See heading, "Landscape Gardening."

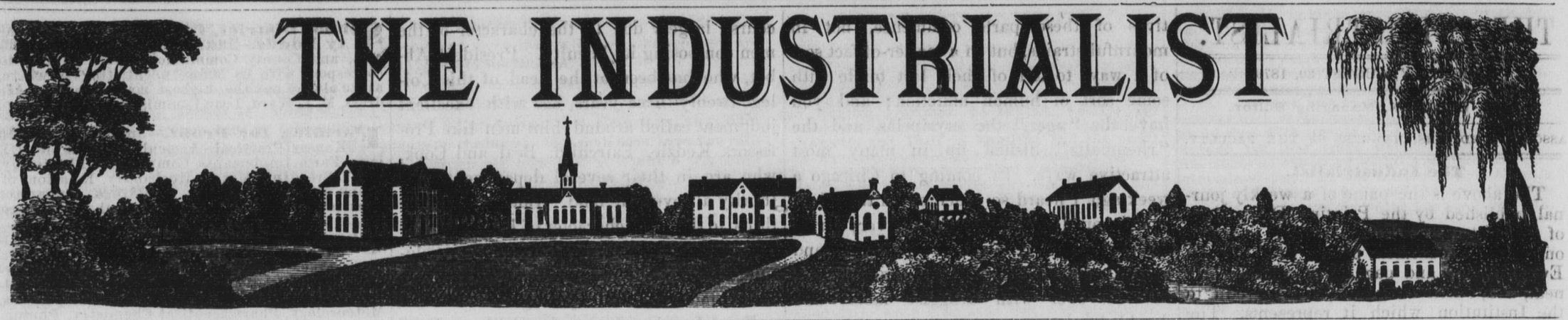
HOUSEHOLD CHEMISTRY. See heading, "Household Chemistry."

HOUSEHOLD ECONOMY

Follows Household Chemistry and consists of lectures by Mrs. Cripps on the art of house-keeping, embracing cookery, domestic management, and kindred topics. Many elderly gentlemen sufficiently know, and more young gentlemen will duly discover, that systematic knowledge of how cooking ought to be done is luminously different from the ability to do it. Instruction without practice can effect but little. Accordingly, a kitchen laboratory has been completely furnished, and affords every facility for drill in the art of cooking. This drill chiefly differs from that of a kitchen in the respect that after a girl has learned to wash dishes or pare potatoes she is not kept everlastingly at either. After full trial, we have found it just as feasible to give this practice, with profit and pleasure to the pupil, as it is to give laboratory practice in chemistry,—and no more expensive.

Printing!—Daily instruction and drill in the work of a First-Class Printer. The Literary Departments offer a thorough education in the construction and use of the English Language, as employed by the Proof-Reader; in Book-Keeping; and in Industrial Drawing, as the best developer of that taste necessarily exercised by every good Job Printer. The Printing Department is well furnished with all the facilities for a speedy mastery of the art of Printing, and is in charge of a practical printer. Besides regular class instruction in printing, the weekly publication of the INDUSTRIALIST by the Department furnishes advanced students the requisite drill in newspaper work.

THE INDUSTRIALIST



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THE INDUSTRIALIST.

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Western Educational Institutions.

No greater truism was ever written by pen or uttered by lip, than that "Education is the lever that moves the world." And no people in the world seem to have a truer appreciation of this fact than the dwellers in that grand region denominated "the West." In the giant strides which that section of our country has of late made in population, wealth and material progress, no interest has improved and expanded with more rapid pace than her educational institutions.

It is only a few years since parents living in the West, who desired to give their children a thorough education, preparatory or collegiate, were compelled to send them to some eastern school, college or university, hundreds of miles away, thus entailing the additional expenses incident to traveling, besides the unpleasant feature of having them so far away from home. Happily for the West, this difficulty has been removed. Her institutions of learning to-day will compare favorably with those of the older States, and her preparatory schools are equal to any in the country. Many of her universities are richly endowed, and have professors who, for deep learning and capacity for dispensing knowledge, are unsurpassed anywhere in the land.

The educational facilities of the West being fully equal to those of the East, there no longer exists any reason why parents should send their children so far away from home to educate them. On the contrary, there are manifold reasons why they should look nearer home for fountains of knowledge. In the first place, when the expense of getting to and from the Eastern schools and colleges is taken into consideration, the cost of an education acquired in Western schools is much less than in the Eastern. In fact, the difference is so very great that it will in future figure as a very important factor in influencing the public in favor of the Western schools. Again, those who patronized the Western colleges will enjoy the advantage of having their children nearer home. They will be enabled to see and converse with them frequently, and refresh their minds regarding their morals and the duties devolving upon them as students and seekers after knowledge; and, in case of sickness, they can be more readily reached and cared for. Finally, the schools and colleges of the West are comparatively free from many vicious practices that have grown up in the old universities of the Eastern and Middle States, and which seem to be a sort of second nature with the students in those institutions. We allude to the disreputable and dangerous pastimes known as "hazing," "rushing," and occasionally open rebellion against the authorities. There is none of that petty spite and animosity against their instructors which, in many of the Eastern colleges, is so deplorably prevalent.

Parents living in the West who contemplate giving their children a liberal education, ought to take these facts into consideration and patronize home institutions.—*Exchange.*

THOUGHT engenders thought. Place one idea upon paper, and another will follow it, and still another, until you have written a page. You cannot fathom your mind. There is a well of thought there which has no bottom. The more you draw from it, the more clear and fruitful it will be. If you neglect to think yourself, and use other people's thoughts,—giving them utterance only,—you will never know what you are capable of. At first your ideas may come out in lumps, homely and shapeless, but no matter, time and perseverance will arrange and polish them. Learn to think and you will learn to write. The more you think, the better you will express your ideas.

Advice to an Old Man.

Remember, my aged friend, that you were young once yourself. Don't forget that, although you were an extremely active and smart young man, there were thousands of just as good men who died when they were boys. It would be well, too, to bear in mind the fact that while no doubt the good old times suited you, and that you knew everything there was to know, still it is quite possible that the world has been moving since you have lost your eyesight and become in a manner fossilized. And it would be well for you to remember the fact of your eating green apples, and then howling all night with the cholera infantum. Don't think that your boy Tom is the only boy who ever stole melons or tied cans to old Brindle's tail.

Just go back over your memory, and if it is half as good in this particular as in remembering how much more you did when a boy than Tom does now, you will probably become impressed with the idea that Tom is quite as good and smart as you were. You needn't acknowledge it to any one, because that would be saying that you were in the wrong, which would never do.

Old men are good for a great many things. They make good fathers-in-law, if they are rich. They are good to pass the contribution box and grumble. But God bless the old men. They are the representatives of the days of ox trains and steamboats,—of the privations which have made the road easy for young men to follow. Don't forget any of this. We all like to hear you boast of what you have done, but don't sit down quite so hard on the boys of to-day. Remember you were a boy yourself once.—*Exchange.*

The Southwest Gate.

The extension of the Atchison, Topeka and Santa Fe Railway, down through the territories of New Mexico and Arizona, will prove the precursor of a mighty trade with that country. In our relations to those two territories, we have the most forcible example of inter-state reciprocity that we have in this country. Both of these territories are not and never will be suitable for any agricultural pursuit other than stock-raising, in which 'tis true they excel, particularly in the growing of sheep.

But the mineral wealth of the country is undoubtedly great. Arizona has some of the richest gold mines in the world, both of quartz and placer. Tin and lead, as well as zinc ores, are more or less plentiful, and this with the territory not more than half explored. We will venture the prediction that in less than two years there will be as great a rush for that country as has been witnessed at Leadville, and with more satisfactory results to the prospectors. Arizona will sustain a mining population within four years of not less than 300,000. This will not be the case with New Mexico, as there are fewer well-defined leads or indications of mineral there; but in some portions of the territory there are very rich silver mines, particularly at Silver City, in the southwestern part. There are also reports from near Santa Fe that there have been rich carbonate discoveries within a short time. How true this report may be we cannot tell, but see no reason why it may not be so, as the formation there and at Leadville is almost identical.

It is easy to see that this country, which of itself will not produce enough to half supply her population, will be forced to import from other States. California has so far been the point from which Arizona has drawn her breadstuffs and meat. In fact, California has been the only one from which these things could be obtained without too great expense; but now that the Santa Fe Railroad has passed through Hooten's Pass, the gate of the Southwest, and is being pushed rapidly forward, we can compete with California, and with success, while it will give almost the entire control of the New Mexican trade. Two results will follow this: First, the employing of a large number of men in prospecting and mining, which will benefit the country at large; second, as these men must be supported, it will furnish a near and ready market for our wheat and corn. We know it is the fashion to condemn railroads, but we believe in justice, and think that the Atchison, Topeka and Santa Fe Railroad Company are deserving of the thanks of every farmer in the State in thus throwing open the southwest gate, through which millions of bushels of wheat will pour in the years to come.—*Western Homestead.*

Watering in a Dry Time.

In the summer drouths which now and then occur, it is common to see persons everywhere at work watering the garden, to keep things alive till the regular rain comes. It is, however, the experience of all that the more the garden is watered the more it wants; and thus on the whole it does little good. Yet water can be so given as to be free from this objection. It is the hardening of the surface which causes the evil, and a hard, compact surface always dries out faster than a loose one. The proper way is to take the earth away for a few inches around the plant to be watered, so as to make a sort of basin, and into this pour the water, letting it gradually soak away. After it has all disappeared and the surface gets a little dry, then draw the earth back again which has been displaced to make the basin. This will make a loose surface over the watered part, which will preserve it from drying out rapidly. Tomatoes, egg-plants, cabbages, and other things of this character, watered in this way, will need no renewal of water for several weeks. It is a slow way of getting such work done, but it is the only sure way of doing it.—*Germantown Telegraph.*

Breadth of the United States.

Few people are aware that the proud boast of Englishmen that the sun never sets on the British Empire, is equally applicable to the United States. Instead of being the western limit of the Union, San Francisco is only about midway between the furthest Aleutian Isle, acquired by our purchase of Alaska, and Eastport, Maine. Our territory extends through 197° of longitude, or 17° more than half way around the globe. The *Rocky Mountain Presbyterian*, in commenting on this fact, says: "When the sun is giving its good-night kiss to our westermost isle, on the confines of Behring's Sea, it is already flooding the fields and forests of Maine with its morning light, and in the eastern part of that State is more than an hour high. At the very moment when the Aleutian fisherman, warned by the approaching shades of night, is pulling his canoe towards the shore, the wood-chopper of Maine is beginning to make the forest echo with the stirring music of his ax."—*Scientific American.*

THE three agricultural colleges proper of France are, Grand Jouan, Grignon, and Montpelier. They have 169 students. The expenses of the establishments are 698,000 francs yearly, against which there is to be written off the one-half for receipts. The students, if meritorious, alternate their residence at these institutions, and so acquire a knowledge of farming practices in different regions.

EIGHTY-TWO per cent of the exports of the United States during the past year consisted of the fruits of the soil.

THE INDUSTRIALIST.

SATURDAY, AUGUST 30, 1879.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

The Industrialist.

The above is the name of a weekly journal published by the Printing Department of the State Agricultural College, and it is one of the handsomest papers in the State. Every column and page is typographically neat, and, taken altogether, it is a credit to the Institution which it represents. The articles are timely and valuable, but there are a few things about the INDUSTRIALIST we would like to see changed. There is just a little more talk about Manhattan than is required by the State at large; and in justice to the very able journals published in that city, and in fairness to them, we would ask that the organ of the State Agricultural College confine itself to topics of State interest. We would like the Managing Editor not to misunderstand us and think it is our policy to find fault, for we have no such intention. We here declare that his work is good, and want more of it and less of the local and personal which in the past has crowded out, we fear, very much that would have been of general interest. We hope to see the INDUSTRIALIST become the great State teacher in agriculture and mechanics, and it will if the little things we have mentioned do not dwarf its usefulness.—*Newton Republican.*

We are much obliged to the editor of the *Republican* for this friendly criticism, and for the opportunity it gives us of offering a word of explanation. We wish that the INDUSTRIALIST was a much better paper than it is,—that we could dispense with these trivial locals and at once place it on a par with the London *Spectator* or New York *Nation.* But let the editor of the *Republican*, before he passes judgment, remember our circumstances. The INDUSTRIALIST is the work, not of professional editors, but of teachers whose daily work consists in teaching from four to six large classes, but who cheerfully contribute these "timely and valuable" articles as they are able. So long as these gentlemen are compelled to bear the burdens that now rest upon their shoulders, the INDUSTRIALIST cannot be carried greatly beyond its present dimensions. But let it be remembered that the INDUSTRIALIST comes of vigorous stock, and it will grow as the Institution which it represents grows, and any other growth than this will not be a healthy one.

Now, about the locals in general, and Manhattan in particular. We have had in attendance at this Institution during the past year something over two hundred and fifty students. Many of these have been in attendance one year and others two and three years, but all have acquaintances and friends in Manhattan, and all regard it in some sense as a second home. It is for the benefit of these students that a portion of the third page of the INDUSTRIALIST is devoted to local College matters and Manhattan news. Some day, gentlemen, the INDUSTRIALIST will be the great journal you hope to see it, but for the immediate future we can only promise to do as we have done in the past,—the best we can.—*Prof. Shelton.*

Notes by the Way. No. II.

It has been growing on me ever since I left Quincy that this country must be the veritable paradise of druggists and patent-medicine venders. Every person here seems to have his or her pet ailment; and whether you are on cars, stage or steamboat, the universal theme of conversation, so far as matters personal are concerned, is sickness in some form, or some other closely related, ghostly subject. When two acquaintances meet, instead of the usual, highly original and exciting observations about the weather and the "craps," the native of these parts commence, not in mournful strains, but in a matter-of-fact sort of a way, to tell of their last tussle with some sort of human affliction; and you have the "ager," the erysipelas, and the "rheumatiz" dished up in many most attractive ways. In coming to Chicago a week ago, I heard so much of all this that, as I dropped off into a doze, the very air of the car seemed redolent of chloroform and opium, and filled with two-ounce bottles covered over with druggist labels and death's heads.

During a ride of two hundred miles I learned a number of invaluable remedies which I propose to impart to the readers of the INDUSTRIALIST. An old gentleman assured me that beech leaves were an infallible remedy for the erysipelas, and still another had found that a decoction of "thistle blows" was a never-failing remedy for the neuralgia. Of puffs for various patent medicines I have a dozen, but these I shall only give through our advertising columns and after our business manager has received the proper references.

THE MICHIGAN AGRICULTURAL COLLEGE.

I spent a very pleasant day at the above Institution, the oldest agricultural college; and, under the guidance of President Abbot, saw the classes, the buildings, the barn, the stock, and gardens belonging to this famous College. It is not my intention to attempt, in this brief paragraph, to tell all that I saw and heard here; but shall content myself with a brief reference to its more salient features.

The Michigan Agricultural College is the oldest agricultural college in America. Its distinctive features are, perhaps, its purely agricultural course—it having never slopped over into mechanics, etc.,—and its labor system, which has been a great success here, but which we believe has failed signally wherever tried elsewhere. Every student, big and little, must labor on the fields or gardens three hours every day of the College week, and only sickness excuses from this. For this labor compensation is allowed, varying from seven to ten cents an hour. Young ladies have not been admitted, except in rare instances, although the officers of the College are, without exception, in favor of opening the College doors to ladies and gentlemen alike. The present difficulty in the way of this innovation is the lack of dormitory accommodations, which the Legislature so far has failed to provide.

I was much interested in the farm, which everywhere shows first-class management. The fields were clean, the fences well kept up, and the crops in excellent condition. I saw here a field of about twenty acres of mangels and Swedes' turnips; and a handsomer field, in point of clean cultivation, even stand, and vigorous growth, I do not remember to have ever seen. The College keeps specimens of six different breeds of cattle; namely, Short-horns, Herefords, Galloways, Devons, Jerseys and Ayrshires. The Short-horns, taken as a lot, are ordinary specimens of the breed, and no more; while the Devons, Galloways and Ayrshires, individually and in point of breding, are good. The Ayrshires, especially, struck me as being a very superior lot, with forms in great uniformity, which indicated the possession, in a large degree, of the milking quality. Prof. Ingersoll, the farm superintendent, is soon to occupy a new field of labor in an adjoining State. Certainly he leaves behind him, all over this large farm, evidences of industry and practical skill which will long bear witness to his efficiency while here.

The great success of this College is of course largely due to the character of the men composing its Faculty. President Abbot, who has been at the head of this College twenty-three years, has with excellent judgment called around him men like Professors Kedzie, Fairchild, Beal and Cook, who are, in their several departments, authority all over the land. But, after all, we think to the high character of President Abbot, his great scholarship, invincible resolution, industry and judgment, all this success is due, more than to anything else.

From Lansing I passed quickly to Kankakee, Ill., the home of the great Short-horn herd of A. M. Winslow's Sons, known generally as the

PUTNEY STOCK FARM,

so named from their old home in Putney, Vermont. This herd enjoys the enviable distinction of being the largest herd of Princess Short-horns in the world. But it must not be supposed that the Putney herd is made up of this very precious old standard sort. Of the one hundred head composing this herd, forty females are Princesses of the choicest strains, and the rest is made up of those grand families, Constances, Fidgets, Acombs, Blooms, (New York Mills sort, with a sprinkling of the plainer-bred Agathas, Arabellas, and others.

At the head of the herd stands the three-quarter bred Princess bull, 2d Duke of Northumberland, whose cut appeared in the *National Live-Stock Journal* of a month ago. I had heard many good things of this bull, and his appearance fully justified all that I had heard of him. He is of good size, a capital handler, with well-sprung ribs, a grand flank and loin with quarters to match. Taken all in all, he is a wonderfully even bull, and a splendid representative of the oldest Short-horn family. That this view of him is the correct one is shown by his record in the show ring. He last year won the sweepstakes prize of $100 at the Illinois State Fair, and similar honors at Dubuque and other great fairs.

Of these Princesses I want to say just a word. I have often heard it said reproachfully of this family that, from a long course of in-breeding, it has lost size, constitution, and the breeding habit, and acquired a great tendency to disease. Never was there a greater mistake, at least so far as this herd is concerned. I saw at Kankakee something like thirty of these high-bred females in one drove in the pasture, and I do not remember to have ever seen a better or evener lot. Instead of undersized, feeble-appearing cows, these were all animals of large size and the most robust constitutions. Most of these cows could easily be made to weigh 1,800 to 2,000 pounds. I am quite prepared now to join in the cry that the next "outcross" on the Duchesses shall be an infusion of Princess blood.

AN EASTERN IDEA.

The Messrs. Winslow have brought to the West many of their thrifty New England ways, some of which, at least, we might adopt to great advantage. For instance, instead of allowing the calves to run at large with the cows, as is generally done, their calves are kept in pens, and the cows driven up every night and morning and milked by hand and the milk fed to the calves from the bucket. By this means better calves are raised than by the old plan, and, what is more to the purpose, their cows never give them trouble in breeding.

Much more might be said of this grand herd and its genial proprietors had we the time and space. I was most fortunate in being able to secure a splendid yearling from this herd, who will hereafter stand at the head of the College herd. Let me, in conclusion, advise all of our Short-horn friends who pass that way to stop over one train and look over the Putney herd; and whether you purchase or not, you will get a hearty welcome from its hospitable proprietors.

E. M. SHELTON.

THE INDUSTRIALIST.

SATURDAY, AUGUST 30, 1879.

Instead of the usual circular or catalogue, we send the Industrialist to those desiring information about the Kansas State Agricultural College. We would call attention to the articles headed "Departments of Instruction," "Industrial Education," "Special Advantages," and "Directions to Applicants." If further information is desired, address Agricultural College, Manhattan, Kansas.

An article from Prof. Failyer about his mountain trip is "laid on the table for one week."

Mr. Thompson's letter arrived on time. Mr. Salter is on the programme for next week, and Mr. Sikes for the week after.

Seven acres of ground south of the new building was seeded down last week to a mixture of blue-grass, orchard-grass and clover.

New students are arriving every day, and it looks very much as though we were to have a "boom" as well as the politicians.

Mrs. Coe expects to return to Manhattan with her daughter Miss Jennie and Miss Sickels. These young ladies will be gladly welcomed by their many student friends.

At the last meeting of the Board a resolution was adopted giving the use of the vacant lot north of the farm-house to those students who may desire to erect dwellings thereon.

The Managing Editor returned from his flying trip East last Tuesday. Although absent on business, this respite from his daily routine of work was a recreation greatly enjoyed.

We would advise every student in this vicinity to attend the lectures to be delivered by Hon. G. W. Bain on next Saturday, Sunday and Monday. Mr. Bain's style of oratory is superior.

Prof. Shelton was, on the 12th of August, unanimously elected to the chair of Practical Agriculture, in the Michigan State Agricultural College. He has not yet decided to accept the offer.

Prof. Platt and party returned from southern Kansas last Monday, having had a pleasant time. The Professor and his family are attending the Church Encampment at Bismarck Grove this week.

The rooms in the building until recently used for recitations are to be devoted to the use of young ladies who may wish to board themselves. Several families can be comfortably accommodated in this way.

Messrs. Reeve and Rose have already taken advantage of the action of the Board giving to students the use of the vacant lot northeast of the College farm, and are erecting thereon a comfortable dwelling.

A handsome roan bull calf, from the Short-horn cow, Grace Young 1st, of College farm,—a pretty Jersey heifer, from Evelena,—and another red Short-horn heifer, from Grace Young 5th,—are among the late additions to the College herd.

Prof. Lazenby, of Cornell University, the well-known teacher, and writer on horticultural subjects, is looking over the College as we go to press. The Professor is looking up the statistics of this and other agricultural colleges in the interest of the Department at Washington.

While in Illinois last week we purchased of A. M. Winslow's Sons, Kankakee, Ill., the high-bred Short-horn bull whose pedigree we give below:

PRINCE CONSTANT.—Red, with little white; calved, Sept. 16th, 1878. Bred by A. M. Winslow's Sons, Kankakee, Ill.

Got by 2d Duke of Northumberland, 22868.
1 dam, Constance of Putney 7th, by 19th Duke of Airdrie, 16694.
2 dam, Constance of Putney 2d, by 2d Earl of Oxford, 6708.
3 dam, Constance III.....by Albion, (19209).
4 dam, Imp. Constance.....by Bridegroom, (11203).
5 dam, Cherry Ripe.....by Sir Walter, (2639).
6 dam, Young Cherry, by Young Waterloo, (8757).
7 dam, Cherry.....by Waterloo, (2816).
8 dam, Old Cherry.....by Waterloo, (2816).
9 dam, ———— .....by Kitt, (7127).
10 dam, ———— .....by Kitt, (7127).
11 dam, ———— .....by Page's Bull, (6269).
12 dam, ———— .....by Middleton's Bull, (438).

Short-horn breeders will recognize in the above pedigree one of the very best and most fashionable Short-horn families. Individually, Prince Constant is a grand yearling; and we doubt not that he will make a reputation in the State that will be equally creditable to his breeder and present owners.

COWLEY COUNTY.

BALTIMORE, Kas., Aug. 23d, 1879.

Editors Industrialist:—As you are expecting a letter from this source, I shall endeavor to give you a few items in regard to this county. Was interested in the Topeka letter, by Mr. Leach, and much pleased with Mr. Rushmore's characteristic communication. I believe a letter each week in the INDUSTRIALIST, from old students, would make its columns more interesting,—although they are always full of the choicest news.

We claim to have the banner county in the State. It has been settled only nine years, but has improved faster during that time than any other county in the State. We shall soon have two railroads, which will terminate at Winfield, our county seat. One is an extension of the Santa Fe branch, which formerly terminated at Wichita, and the other is an east and west road,—the one and only one the people need. These roads will greatly add to the prosperity of Winfield, and will make it one of the liveliest towns in the southwest.

Wheat is a tolerably fair crop here this year. Some pieces average twenty bushels to the acre, while others make but five or six. Cowley county never had better prospects for an unusually large yield of corn than it has now. A stalk occasionally comes to light, eighteen feet high with three fully-developed ears. There is not as much stock here as in Riley county, and it is not as good, with the exception of hogs. We have as fine hogs here as they have anywhere.

Our county has not been very largely represented at the College heretofore. I have done what I could to induce more students to attend this coming year. Regret to say that I shall not be able to attend the fall term. Have often wished myself in the INDUSTRIALIST office again, and would say to those who wish to learn the printer's trade that they will never regret a course in that office.

Lest I become too tedious and lengthy, I will close. Accept my best wishes for the College and all connected therewith.

Truly, yours, GEORGE F. THOMPSON.

LATER.—Mr. Thompson writes again and says he has made arrangements to return to College. Will be here about the 13th.

NATIONALIST ITEMS.

The Ulrich boys have a new bicycle. It is the best in town.

The school just across the Kansas has been given to Miss Ella Child.

A letter from Ed F. Waring, who is at Upper Mattole, Cal., says that he is in poor health.

We understand that the contract for a building similar to the one just finished by S. M. Fox has been let to Wm. Smith, by G. W. Higinbotham, to be built on the lot recently occupied by Brown's lumber yard.

We understand that J. T. Ellicott has arranged for a hay-press, and will have it in operation within a few weeks near his elevator. This is a good thing, as it will furnish a sure market for the surplus hay of this vicinity.

George W. Bain, of Kentucky, is probably the finest temperance lecturer in the United States. He is an educated, christian gentleman, and is a natural orator. On Saturday, Sunday and Monday, Sept. 5th, 6th and 7th, he will lecture in Manhattan, and everybody should arrange their affairs so that they can enjoy this intellectual treat.

Professor Platt, of the State Agricultural College, at Manhattan, spent a few days on a visit with his brother, Rev. L. H. Platt, of this place, last week, and left last Tuesday morning. Prof. Platt has been with the Agricultural College without intermission for the past fifteen years, probably the longest term that any one has been connected with a State educational institution in Kansas. He reports the Agricultural College in a more flourishing condition than ever, with the prospect of having a greater number of students next fall than any previous year.—*Eureka Herald.*

SPECIAL ADVANTAGES.

We enumerate a few of the special advantages which the Agricultural College presents to the young people of the State of Kansas:

First: Although an industrial school, as thorough and as complete an education—using the term in its popular sense—can be acquired here as in other schools. A student will make as rapid advancement here as elsewhere in the studies pursued, whether he remains here one or two years, or through the whole course.

Second: While obtaining a knowledge of English, mathematics, and the natural sciences, every student is learning some useful trade or art. This peculiar feature of the Agricultural College is a success. It should no longer be regarded as an experiment. Those who have been here one, two or three years are now in good positions, receiving good wages as telegraph operators, printers, carpenters, etc. Young men who have been through the course in practical agriculture and horticulture are rapidly becoming known as the best farmers in the localities in which they reside.

Third: The expenses are brought down to the lowest possible point. There are no matriculation fees, no tuition bills, no college customs, which compel a useless expenditure for badges or dress. The expenses are simply the cost of living, and the text-books used.

Fourth: The high moral and religious influence which exists at Manhattan. The students of the Agricultural College are young men and women of excellent character. Their average age is about eighteen years. They are deeply in earnest in their efforts for advancement. Of course there are a few exceptions, but the vicious or shiftless are soon thrown out. "Attend to business or leave" is the one rule. A wholesome religious influence pervades the Institution. The students' weekly prayer-meeting has been well sustained for more than ten years.

Those intending to take boarders next term, or who have rooms to rent, either furnished or unfurnished, are requested to notify Prof. Ward or A. A. Stewart of the fact. A great many applications are being received.

DIRECTIONS TO APPLICANTS.

TERMS OF ADMISSION.

Candidates for admission must be fourteen years of age, and pass a satisfactory examination in reading; arithmetic, through decimal fractions; and English grammar, to syntax. Classes are started at the beginning of each year in Drill in Arithmetic and Drill in English; and the pupil must have the knowledge above indicated, else he will be unable to retain position if admitted.

Pupils will be received at any time during the year, if able to pass an additional examination upon the subjects studied by the classes which they expect to enter. But they will find it greatly to their advantage to be present at the opening of each term, or as soon thereafter as posssble.

GRADES.

Both the Literary and Industrial recitations are graded daily upon a scale of 100; and an examination of all classes is made at the close of each month. A student not attaining an average grade of sixty is promptly dropped to a lower class, or excluded from the Institution until able to do so. The work of grading is strict and uniform in all the departments, and this process is rigorously used for sifting out incompetent and indolent pupils; thus more than accomplishing all that is designed to be effected by a "high standard of admission." Hence, the student's continuance in the College wholly depends upon his own action.

The course is based upon the determination to make the labor required in the preparation of one industrial and three literary recitations as much as the average student can perfectly perform, in ten hours a day. We design to give the pupil the worth of the time expended at College; and, in order thereto, he must do a full day's work with brain or hand. Only those students who can maintain a standing of ninety in each study will be allowed to take more than the prescribed number of recitations; and no one will be permitted to have less than one industrial and three literary recitations.

RELIGIOUS.

Unless otherwise directed by parents, students are required to attend chapel at 8:30 A. M. on academic days, and divine service once every Sabbath.

EXPENSES.

There are no charges whatever for enrollment, attendance or instruction in the regular courses; nor are there any "contingent fees" for the repair of buildings, for the use of books or apparatus, for diplomas, or the kindred privileges usually grouped under the term "contingent." Male students are furnished instruction, the use of apparatus, instruments or tools, in both the literary and industrial classes marked out for them, without any charge. And the same is true of female students in the regular classes provided for them. Printing and Telegraphy are industrials primarily provided for the education of female students, and male students taking either of these are charged $1 per month for use of instruments.

Instrumental music is a fine art or "accomplishment," rather than a mechanical art. We do not place it among our "industrials" in the same sense, or for the same purpose, that we do those provided for teaching the trades. Accordingly, the following fee is required from female students for tuition and the use of instruments:

Terms per week:

Private lessons, 2 a week, on any instrument, $1.00
Private lessons, 1 a week, on any instrument, .60
Class lessons, 2 a week, on any instrument, .65

Instruction in harmony, etc., etc., from ten to fifty cents per week, as the student may or may not be in other classes.

The only charge made for material in either the literary or industrial departments is for the chemicals used by students in laboratory practice, which are furnished at wholesale prices, and amount to but a small sum.

Furnishing an absolutely free education is as much as can be reasonably asked; and the Institution neither boards, clothes, nor supplies the student with text-books. Boarding can be obtained in private families at from $2.75 to $4 per week. Washing costs from seventy-five cents to one dollar per dozen. Text-books, which can be procured in Manhattan, cost from $2 to $5 per term.

No student need expend over $5 per week; and many of our best pupils are living at $1.25 per week. Students desiring to "board themselves" can do so at from $1 to $2 per week. In a club of four young men, renting a house, the average cost to each for the term was $1.11 per week.

LABOR.

Manual labor by the students may be for either of two purposes: First, to acquire skill in a given art; second, to earn money. In the first case, the labor is educational; in the second, it should be paid for by the party benefited.

Educational Labor.—Manual labor in the recitations of the Industrial Departments, like mental labor in those of the Literary Departments, is purely educational and will not be remunerated. While the interest of the student will be held paramount in the direction of this labor, the practice necessary to dexterity will be required.

Remunerated Labor.—When the Institution needs labor on the Farm or elsewhere which is not educational, but simply for its own profit, and which a student is able and willing to perform, it becomes an employer instead of a teacher, and he an employe instead of a scholar. It pays for work, he works for pay. The relation between them is commercial, not educational; and both parties must act upon business principles. Hence, the College furnishes only such employment as its own interests require, and will pay according to the value of the service rendered at from seven to ten cents an hour.

AMOUNT EARNED.

It is impossible to predict how much a given person can earn, since that depends upon what he can do and what work there is to be done. Hence, it is wholly impossible for us to answer the question so often asked: "Do you think I can meet my expenses by work?" Some students make one-half their expenses, some the whole, and exceptional men have made more than expenses. As a rule, a faithful boy skilled in farm work can earn half his expenses on the Farm or in the Nursery. During the year he can ordinarily acquire sufficient skill in the wood or iron shops to enable him to make articles for sale. The whole question is one for his own consideration and decision. We can teach all who come, but cannot absolutely *promise* anything more. Hitherto we have refrained from holding out strong inducements respecting the amount of labor we might have to offer; but in view of the fact that during each of the last three years we have had more to do than the students could perform, we are inclined to give greater and positive encouragement on this point. Any boy who is in dead earnest, who is familiar with farm operations, and who can raise $50 to start with, should be able to carry himself through the four years' course. And certainly this places an education within the reach of every determined boy. As yet we are unable to offer similar advantages to girls, not requiring labor in the College departments which they can perform.

RULES.

1. Behave as a true man or woman should, at all times and in all places.

2. Attend to your own business promptly, thoroughly and courteously; and vigorously let alone that of other people.

3. Penalty: "Leave!"

PUBLICATIONS.

The "Hand-Book," published in 1874, containing a full discussion of the educational question and the aims of the Institution, will be forwarded to any one desiring it.

THE INDUSTRIALIST, a weekly journal edited by the Faculty and published by the Printing Department, contains original and seasonable articles on the Farm, Orchard, Trades, Sciences, and Education. Price, 75 cents a year. Address A. A. Stewart, Manhattan.

CALENDAR.

Fall Term, 1879.—Will begin Wednesday, September 10th, 1879, and close December 18th, 1879.

TO NEW STUDENTS.

Bring the text-books you have been using. On arrival, first arrange for your boarding. A. A. Stewart will furnish information, either by letter or on application, concerning boarding places or rooms for rent. Report to the President at 8:30 A. M., immediately after chapel exercises, for enrollment.

For further information apply to Jno. A. Anderson, President, Manhattan, Kansas.

RAILROAD TIME-TABLE.

KANSAS PACIFIC RAILWAY.

PASSENGER ARRIVES.

No. 2, going East..... 11:58 A. M.
No. 4, going East..... 3:28 A. M.
No. 1, going West..... 4:03 P. M.
No. 3, going West..... 4:51 A. M.
No. 7 (freight), going West..... 8:45 A. M.

Nos. 1, 2 and 7 run daily No. 3 runs daily except Monday. No. 4 runs daily except Sunday. Passengers with tickets are carried on No. 7.

GEO. C. WILDER, Agent.

THE INDUSTRIALIST.

SATURDAY, AUGUST 30, 1879.

Industrial Education.

The real value of an education to the student depends upon two things: First, the practical worth of the knowledge taught; and, second, the degree in which he makes it his own. Hence, the ability of any institution to give a practical education depends upon the kind and aim of the knowledge it teaches, and upon the thoroughness of the instruction therein. The State Agricultural College was directly endowed by Congress, and is guided by the State, for the specific purpose of furnishing to the industrial classes of Kansas a "practical" education, that is, "one fit for use." As its name indicates, and as the statistics of the industries of the State require, its chief work must be that of giving a useful and usable education to those who will engage in farming; and, therefore, the Farmer's Course must, from the nature of the case, be its main one.

FARMER'S EDUCATION.

Words and figures are merely instruments with which to record ideas. They are not themselves ideas, nor should they be made the chief end of an education. As a wagon is necessary to haul grain, so are they a necessary part of an education; but as the wagon is not the grain, so they are not the knowledge which the farmer converts into money. Hence, the classics and higher mathematics are not taught. But it will be noticed in the following course that so soon as the pupil acquires working skill in the use of the English language as a tool, and of figures and lines as mathematical tools, those arts and sciences which present knowledge that has a cash value to the farmer are taught as rapidly as their importance and thorough acquisition will permit. Studies numbered (1) and (4) in the second, third and fourth years are the spine of the course, to which the others are as ribs and muscle.

FARMER'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Practical Agriculture (advanced.)	1. Drill in English.	1. Botany, Entomology.	1. Physiology.	1. Physiology.	1. Drill in English.	1. Farm Economy, Special Hygiene.	1. Drill in English.
2. Geology, Mineralogy.	2. Drill in Arithmetic.	2. Inorganic Chemistry.	2. Rhetoric.	2. Rhetoric.	2. Drill in Arithmetic.	2. Geology, Mineralogy.	2. Drill in Arithmetic.
3. Polit. Economy, Practical Law.	3. Industrial Drawing.	3. Practical Geometry.	3. Algebra.	3. Algebra.	3. Industrial Drawing.	3. Polit'l Economy, Practical Law.	3. Industrial Drawing.
4. Zoology.	4. English Structure.	4. Horticul., Landscape Gardening.	4. English Literature.	4. Practical Agricul. (elementary).	4. English Structure.	4. Zoology.	4. English Structure.
5. Agricul. Chemistry Meteorology.	5. Adv'd Arithmetic, Book-keeping.	5. Organic, Analytical Chemistry.	5. Physics.	5. Physics.	5. Adv'd Arithmetic, Book-keeping.	5. Physic'l Geography, Meteorology.	5. Adv'd Arith., Book-keeping.
6. Logic.	6. U.S. History, Industrial Drawing.	6. Practical Surveying.	6. Industrial Drawing.	6. Industrial Drawing.	6. U.S. History, Industrial Drawing.	6. Household Economy.	6. U.S. History, Industrial Drawing.

WOMAN'S EDUCATION.

Nearly one-half of our students are females, and the Woman's Course is prepared expressly for their liberal and practical education. We have no doubt whatever that practical men and women, who understand what it means and what it seeks to do, will fully endorse it.

WOMAN'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Farm Economy, Special Hygiene.	1. Drill in English.	1. Botany, Entomology.	1. Physiology.	1. Physiology.	1. Drill in English.	1. Farm Economy, Special Hygiene.	1. Drill in English.
2. Geology, Mineralogy.	2. Drill in Arithmetic.	2. Inorganic Chemistry.	2. Rhetoric.	2. Rhetoric.	2. Drill in Arithmetic.	2. Geology, Mineralogy.	2. Drill in Arithmetic.
3. Polit'l Economy, Practical Law.	3. Industrial Drawing.	3. Industrial Drawing.	3. Algebra.	3. Algebra.	3. Industrial Drawing.	3. Polit'l Economy, Practical Law.	3. Industrial Drawing.
4. Zoology.	4. English Structure.	4. Horticul., Landscape Gardening.	4. English Literature.	4. English Literature.	4. English Structure.	4. Zoology.	4. English Structure.
5. Physic'l Geography, Meteorology.	5. Adv'd Arith., Book-keeping.	5. Organic, Household Chemistry.	5. Physics.	5. Physics.	5. Adv'd Arith., Book-keeping.	5. Physic'l Geography, Meteorology.	5. Adv'd Arith., Book-keeping.
6. Logic.	6. U.S. History, Industrial Drawing.	6. Household Economy.	6. Industrial Drawing.	6. Industrial Drawing.	6. U.S. History, Industrial Drawing.	6. Logic.	6. U.S. History, Industrial Drawing.

MECHANIC'S EDUCATION.

Because of the adaptedness of the leading course to the wants of the intelligent mechanic, it has been found practically unnecessary to diverge from the Farmer's Course. Additional studies, specially adapted to the mechanic's use, will be furnished in a Post-Graduate's Course.

If it be urged that the distinctively agricultural knowledge taught in the Farmer's Course is not directly valuable to the mechanic, we reply that, admitting the point for the purpose of argument, yet: 1. This knowledge is of more practical value to the mechanic than is the Latin, Greek, or a half dozen other things embraced in the usual course preparatory to the professions; 2. That the great majority of Kansas mechanics will also be more or less engaged in agriculture; 3. That those studies in the course which are directly valuable to the mechanic, together with the shop facilities, offer a better mechanic's education than can be elsewhere found west of the Alleghanies.

INDUSTRIAL DEPARTMENTS.

Having knowledge in the head is one thing; ability to use it with the tongue, fingers or feet is quite another thing. Both are vital to success in practical life. A man might thoroughly understand the theoretical principles of carpentry, and yet, not having used the tools, be wholly unable to earn carpenter's wages. So in all other vocations. Accordingly, instruction is given in the following well-equipped Industrial Departments, and every student is required to recite in some one of them, as selected by the pupil or parent:

FOR MALE STUDENTS.	FOR FEMALE STUDENTS.
The Farm.	Dress-making.
The Nursery.	Printing.
Carpentry.	Telegraphy.
Cabinet-making.	Scroll-sawing.
Turning.	Carving.
Wagon-making.	Engraving.
Painting.	Photography.
Blacksmithing.	Instrumental Music.

Each of these departments is conducted exactly as in daily life, and aims to give precisely the drill received by an apprentice. No charge is made, either for tuition or material, from male students taking the Industrials provided for them; nor from female students taking the ones provided for them, except in Instrumental Music. Male students taking either Printing or Telegraphy are charged $1.00 per month for the use of instruments and material.

DEPARTMENTS OF INSTRUCTION.

DEPARTMENT OF AGRICULTURE.

PRACTICAL AGRICULTURE.

Second Year:—General principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage.

Fourth Year: General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of a rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farmhouses; barns.

FARM ECONOMY.

Woman's Course, Fourth Year: Dairy products as human food; influences affecting character of milk; manufacture of condensed milk; the factory system and household plan of cheese-making; treatment of rennet; general process of cheese manufacture; subsequent treatment of cheese; butter-making; creameries; "deep" and "shallow" setting systems; general process of butter-making; packing and preserving butter.

DEPARTMENT OF BOTANY AND PRACTICAL HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest; also a course of lectures on Landscape Gardening. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard; fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture; shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in in the work of laying out and plotting grounds topographically.

CHEMICAL DEPARTMENT.

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life. Text-book, Ganot.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blowpipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

Are constantly in progress in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

DRILL IN ENGLISH.

"As grammar was made after language, so ought it to be taught after language."—*Herbert Spencer.*

Drill in English embraces the following topics:

Sounds of the language; drill in producing the vocal, sub-vocal and aspirate elements with accuracy, distinctness and volume; vowels, consonants.

Letters: Form; power; rules for spelling, drill.

Words: Signification, properties, modifications, variations, relation and dependence.

Sentences: Drill in statement of ideas; description, clearness, terseness, vigor; business letters, discussion; capitalization; syllabication; punctuation; construction and analysis of sentences; elements, uses and names; criticism of compositions printed as written; proof reading; grammatical construction; superfluous words and clauses; drill in reading, speaking and penmanship.

Text-books: Webster's Academic Dictionary; Lee & Hadley's Advanced Lessons in Language.

Pupils deficient in spelling, etc., should enter the printing class, the printing-office being the work-shop of language.

STRUCTURE OF ENGLISH.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

MATHEMATICAL DEPARTMENT.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

DRILL IN ARITHMETIC.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Following this line, the student, so far from hammering away at "pure" science draws from the mathematical store-house what he needs, and sees why he needs it. Accuracy of calculation and posting, rather than a *mere* comprehension of the principles, is aimed at. Besides the recitation-room drill in business forms, practice in the field is also given. Estimating the number of cords in a pile of wood said to be 100x4x4 feet is one thing; measuring a pile of wood through which any number of cats may be harmlessly thrown, and in which four-feet sticks are the exception, is quite another and more difficult thing.

ARITHMETIC AND BOOK-KEEPING

Is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides ensuring arithmetical practice, develops practical skill in that important art.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admiral system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study. In addition, constant practice in the application of lines to metal and wood is furnished in the Blacksmith, Carpenter, Turning, Scroll-sawing, Carving, Engraving and Printing shops, and to fabrics in the Sewing Department.

PRACTICAL GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the use of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

PRACTICAL SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

STUDIES SPECIAL TO WOMAN.

Besides the studies already indicated, attention is called to the following:

SPECIAL HYGIENE.

As shown in the course, one term is devoted to the study of Physiology, from the text-book of Dr. J. C. Dalton. This is followed in the fourth year by a course of lectures to young ladies by Mrs. Cripps on the subject of Hygiene, embracing such instruction in hygienic matters as are valuable to woman.

FARM ECONOMY considers those affairs of the farm which usually come under the supervision of the farmer's wife or daughter, and which are not included in "gardening" or "household economy;" such as butter and cheese-making, dairy management, etc. A course of lectures is delivered by the Professor of Practical Agriculture. See heading, "Farm Economy."

GARDENING is included in Practical Horticulture. See heading, "Landscape Gardening."

HOUSEHOLD CHEMISTRY. See heading, "Household Chemistry."

HOUSEHOLD ECONOMY

Follows Household Chemistry and consists of lectures by Mrs. Cripps on the art of house-keeping, embracing cookery, domestic management, and kindred topics. Many elderly gentlemen sufficiently know, and more young gentlemen will duly discover, that systematic knowledge of how cooking ought to be done is luminously different from the ability to do it. Instruction without practice can effect but little. Accordingly, a kitchen laboratory has been completely furnished, and affords every facility for drill in the art of cooking. This drill chiefly differs from that of a kitchen in the respect that after a girl has learned to wash dishes or pare potatoes she is not kept everlastingly at either. After full trial, we have found it just as feasible to give this practice, with profit and pleasure to the pupil, as it is to give laboratory practice in chemistry,—and no more expensive.

Printing!—Daily instruction and drill in the work of a First-Class Printer. The Literary Departments offer a thorough education in the construction and use of the English Language, as employed by the Proof-Reader; in Book-Keeping; and in Industrial Drawing, as the best developer of that taste necessarily exercised by every good Job Printer. The Printing Department is well furnished with all the facilities for a speedy mastery of the art of Printing, and is in charge of a practical printer. Besides regular class instruction in printing, the weekly publication of the INDUSTRIALIST by the Department furnishes advanced students the requisite drill in newspaper work.

THE INDUSTRIALIST

VOL. V. MANHATTAN, KANSAS, SATURDAY, SEPTEMBER 6, 1879. No. 21.

THE INDUSTRIALIST.

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Something About Wheat.

The almost universal rule of farmers in this section is to plow once only for wheat. They consider it best. Is this the generally accepted theory of the best wheat-growing districts of your State? Give us,—1. Your opinion. 2. The information. E.
Pinckneyville, Ill.

Our personal experience is that the land being in good tilth and free of weeds that one plowing is as good as more, and as a rule we should not plow more than 4 to 5 inches deep for sowing upon. One must know something of the nature of the soil in order to form a just estimation of the necessary requirements and the most feasible means of arriving at the best result in cultivation. One rule will always be patent, the soil for winter wheat especially should be compact. By this we do not mean hard and unfriable. A soil may be compact and yet friable. If the soil is loose, and lacks cohesion, lime, ashes, and pulverized clay will be indicated. If, on the other hand, it be inclined to crust, break or run together, while the substratum may remain intact, the surface should be worked into as complete a tilth as possible. For wheat the soil should be compact, but at the same time the surface should be friable. Hence, the advantage of harrowing the crop with a light drag to break the crust, a practice often followed both in the autumn and in the spring.

The drilling of fall wheat has now come to be the almost universal practice. This for several reasons, the principal ones are: The seed is deposited in the straight lines, and at an uniform depth as required. There is no seed left on or near the surface, and hence one-quarter less seed is necessary. Slight depressions are left along the lines of drills which gradually fill up, thus supporting the young plant. The crop may be harrowed lengthwise of the drills, doing almost no injury to the plants; and when the soil is light and fluffy, the seed may be deposited at a depth at which it will germinate freely, and at the same time where it may quickly get deep roothold, and thus be enabled to withstand freezing better. For the reasons as stated, sod land usually is exempt from heaving, from freezing and thawing. The whole sod stratum is lifted equally, if at all, and thus the roots are not broken.

From what we have written, we think you may form an opinion as to conditions necessary to success in your locality. One thing should always be remembered. Upon soils liable to heave, or upon soils inclined to be wet, winter wheat can not be successfully grown. The last season was a remarkable one in several respects. The autumn was dry, deep snows generally covered the ground during the winter, and in many sections wheat grew under the snow. The spring was rather dry, but with sufficient moisture for the growing plant. The early summer gave just the requisite rain needed, and the harvest season was all that could have been asked for. The result was the greatest crop of winter wheat ever harvested in the West. The same natural conditions may not occur again for many years. Yet from this an important lesson may be learned. Wheat requires, 1, a well-drained soil; 2, a soil that is compact; 3, a soil not liable to heave; 4, soil not liable to be alternately strongly heated and cooled; 5, cool equable weather during the growing season. —*Prairie Farmer.*

Learning Farming.

It is generally understood that to be a mechanic a man must serve an apprenticeship at the trade. The mechanical principles, as well as the practical application of those principles, must be learned. If mercantile pursuits are to be engaged in, a course of education in a commercial and business college is essential; and then the practical details of the business must be learned under the eye of one experienced in the business. This is true also in regard to all the learned professions. No man expects to enter on a successful career in any of these without years of study and preparation. And no one would think of employing any one professionally who had not qualified himself for his calling by this course of thorough preparation.

This being the case in regard to the other callings in life, it would seem but reasonable that the farmer, who for the highest success in his vocation requires a more general and varied knowledge than is necessary for any other business, should seek for that previous training which alone can qualify him for such success. But such is not usually the case. It seems to be the prevailing opinion among men, and especially among farmers, that anybody can farm, whether he has any previous knowledge of or preparation for the business. There is, happily, a change in the public mind on this subject; and the time is doubtless near when a man will no more think of engaging in agricultural pursuits without an agricultural education than he would now engage in professional life without a suitable education. The young man who intends to engage in farming should serve a thorough apprenticeship under the eye of a first-class practical farmer.—*Ohio Farmer.*

Five Much-Confused Words.

Land--Ground--Earth--Soil--Dirt.

An esteemed correspondent ("C. G. T.," of Galesburg, Ill.,) asks us to specify exactly the differences in meaning between the above words. We are happy to do so,—not that we suppose many readers, or still less "C. G. T.," can really need much instruction in the matter; but the terms are often used incorrectly from mere oversight and carelessness, and it may be well to recall to memory the strict proprieties of the case.

Land, then, we should say, is pre-eminently the geographer's and the surveyor's word, indicating primarily the solid portion of the globe as distinguished from the ocean, and secondarily any particular subdivision of that solid portion. "Four-fifths of the *land* of Great Britain is held by seven thousand proprietors."

The *ground* is the surface of the land. We break *ground* for a new building or railroad.

Earth, beside its astronomical usage as the proper name of our planet, indicates the material of which a considerable portion of the outside of the planet is composed, exclusive of water and rocks. The civil engineer, about to construct an embankment, calculates how many cubic yards of *earth* will be required for the purpose.

Soil is the earth considered from an agricultural point of view, and is especially the farmer's word. The substance is no longer thought of as an homogeneous mass weighing so much per cubic foot, but as a very complex mixture and compound of many different elements, and possessed of a great variety of chemical as well as physical properties. It is therefore much better to speak of raising a certain crop on good soil, than on "good land" or "good ground,"—neither of which phrases expresses exactly the meaning that the speaker wishes to convey.

Dirt, lastly, has been succinctly defined as "matter in the wrong place," and should never be applied to earth except when it is sullying or defacing something. To speak of packing "dirt" around the roots of a tree is a detestable error. Our Illinois correspondent wrote, a few weeks ago (*Country Gentleman*, page 469,), that "that there is more dirt in four or five of the richest counties of Illinois than (excluding the river towns) in the whole 44,500 square miles of Mississippi." He did not mean that there is more land to the acre, or more earth as distinguished from rocks, or a greater depth of tillable soil, but only that there is a greater quantity of filth.

To restate the whole matter in a different way:

A person going West to farm will perhaps take up government *land*, and the first question to be decided will relate to the position and extent of the *land* to be selected,—a purely geographical matter. Next he will probably look over the *ground*, considering chiefly its surface and what there is on it. Then he must know what is the character of the *soil*,—its chemical constitution and mechanical condition. When he comes to build his house and excavate the cellar, he will throw out *earth*; and if, in the process, some particles of this earth are deposited on his shirt front, to the detriment of the appearance of that article, and the disgust of its proprietor, then, and not until then, does the earth deserve the repulsive and unsavory appellation, "*dirt*."—*Country Gentleman.*

How to Grow Cuttings off Geraniums, Verbenas, etc.

To prepare pots for raising cuttings, fill them two-thirds full with rich loam,—dark and porous, not clayey and heavy. Then pour on an inch or two of yellow sand; wet this thoroughly, and place the cuttings close to the edge of the pot. The contact of the pottery promotes the growth of the cutting.

Cuttings should be taken from the young and newly-formed wood of the plant; but the lower extremity of it should not be too young and soft, else it will absorb too much moisture and decay: neither should it be too old and hard, for then it will not imbibe moisture enough to throw out roots. Therefore, cuttings should be taken off at the junction of the old and new wood, so that these extremities will be avoided. They should be cut off just below a joint or bud, as the roots start from that point, and if a bud is not left at the base it is liable to decay. The cut should be made straight across the stem, taking care not to bruise the bark or leave it jagged. Most of the hardy, wooded shrubs and plants are easily propagated by cuttings placed in the open air; but the tender, watery-stemmed plants, like verbenas, heliotropes, fuchsias, etc., should be covered with a hand-glass or raised in a hot-bed, shaded the first three days from excessive sunlight.

Cuttings of certain plants can be readily started in water; and, in the early spring, if you have not a greenhouse or a hot-bed, it is the safest plan. Fill small bottles or vials with warmish water; remove the lower leaves of the cuttings (be sure to have a bud at the base) and put them in the water; hang the bottle up to the window-sash, tying a string about the mouth for this purpose. If cotton-wool is put around the mouth of the vial, it will prevent the evaporation of the water, and make the roots sprout more quickly by keeping up an even temperature. Oleanders can be rooted in this manner; also, heliotropes, verbenas, roses, fuchsias, and all kinds of bedding-out plants. The process is so simple that a mere child can succeed with it. As soon as the roots are an inch long, the cutting should be transplanted, taking care to spread out the tiny rootlets as they grow in the water. Some fill up the bottle with rich earth, let it dry off two or three days, and then break the glass or pot and plant out the cutting without disturbing its roots in the least degree. This is the most certain way of obtaining plants from cuttings.—*Every Woman her own Flower Gardener.*

THE INDUSTRIALIST.

SATURDAY, SEPTEMBER 6, 1879.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

President Anderson.

Rev. John A. Anderson having tendered his resignation some months since as President of the Kansas State Agricultural College, in consequence of his election to Congress, the following resolutions were adopted by the Board of Regents, at their recent session:

Resolved, That we accept with reluctance and deep regret the resignation of President Anderson, and take this opportunity to express our sincere appreciation of the great work he has accomplished in the cause of real practical and industrial education.

Resolved, That we record our warm appreciation of President Anderson's untiring, unselfish and unswerving devotion, for the past five years, to the general interests and welfare of this College. To him does it owe the inauguration of a policy which now promises certainly to provide for its patrons an education commensurate with the wants and needs of the youth of a young and growing commonwealth.

Resolved, That we convey to President Anderson the expression of our warm personal esteem and consideration. The private traits of character which have disclosed to us his innate nobleness and true manhood command our admiration and deep regard. Confident that he will discharge the public trusts now imposed him as faithfully, as conscientiously, and as intelligently, may his political service receive equal commendation.

The Faculty.

At the last meeting of the Board of Regents the presidency of the College, made vacant by the resignation of President Anderson, was filled by the election of Prof. George T. Fairchild, for upwards of sixteen years Vice-President and Professor of English Literature in the Michigan State Agricultural College. Prof. Fairchild is a graduate of Oberlin, and is a brother of President Fairchild, of that Institution.

Of our new President we have space for only a few words. Prof. Fairchild combines, in an eminent degree, thorough knowledge of literature and science with a familiar acquaintance with the "new education," and especially with that branch of this education which relates to our agricultural and industrial colleges. He is thoroughly identified with the agricultural interests of the State, having been for many years a prominent lecturer at the farmers' institutes and other farmers' gatherings. We venture to say that the agricultural and industrial work of the College will not suffer at the hands of President Fairchild.

The chair of Chemistry and Physics has been filled by the re-election of Prof. George H. Failyer. This announcement we know will be received with sincere pleasure by the old students, with whom he has labored so earnestly and conscientiously during the past year.

E. A. Popenoe, the recently-elected Professor of Botany and Horticulture, is an old resident of Topeka, and comes to the College highly recommended by Alfred Gray, Peter McVicar, J. K. Hudson, and other prominent men of the State. Prof. Popenoe is a graduate of Washburn College, of the class of '76, and since 1873 has been Entomologist of the State Board of Agriculture. He is an enthusiastic student of natural history and kindred subjects, and his collection of objects of natural history is said to be one of the best in the West.

D. H. Graham, elected Superintendent of the Telegraph Department *vice* W. C. Stewart, resigned, is a skillful operator and successful teacher from Chase county. Mr. Graham comes to his work at the College with high recommendations from the prominent men of his locality.

The Faculty as reorganized stands as follows:

GEORGE T. FAIRCHILD, *President-elect.*
M. L. WARD, *Prof. Mathematics and English.*
E. M. SHELTON, *Prof. Prac. Agricul., Sup't Farm.*
G. H. FAILYER, *Prof. Chemistry and Physics.*
E. A. POPENOE, *Prof. Botany and Horticulture.*
J. E. PLATT, *Prof. Elem'y English, Mathematics.*
JNO. D. WALTERS, *Teacher Industrial Drawing.*
T. T. HAWKES, *Sup't Mechanical Department.*
A. A. STEWART, *Sup't Printing Department.*
D. H. GRAHAM, *Sup't Telegraph Department.*
MRS. M. E. CRIPPS, *Sup't Sewing Department.*
W. L. HOFER, *Teacher of Instrumental Music.*

NON-RESIDENT LECTURER.

HON. D. J. BREWER, (of the Kansas Supreme Court,) *Lecturer on Practical Law.*

The Drive-Well Extortion.

The "drive-well" fiends have put in an appearance in Kansas, after a campaign of extortion in Iowa. It is reported that they have already commenced about a hundred suits against persons in this State for infringement on their "patent." There are thousands of these wells in Kansas, and these fellows claim that they are entitled to a royalty on each one. They assert that they have succeeded in getting favorable decisions. in several cases, in the courts of several States. There ought to be some short, sharp way of protecting people from the extortions of such persons. The idea that a citizen cannot make a well, either by driving or digging, whenever or wherever he pleases, without paying a royalty to some one who claims a "patent," is simply intolerable. Some fellow might as well assume to have a "patent" on the air we breathe as on the water we drink.—*Atchison Champion.*

Of the legal aspects of this case we know nothing; but we do know, as a question of right, that this is one of the biggest swindles that has ever been attempted upon an individual or community. Unless they are checked, it is quite certain that these fellows will draw several thousand dollars from every organized county in the State.

While in Michigan recently, we heard of a case similar to this drive-well extortion. Several years ago parties in one of the Eastern States patented the common sliding gate, now in use on nearly every farm. After getting this patent they commenced the tactics more recently pursued by these drive-well men. For a time they completely terrorized the farmers, and their gains were enormous. From a single county in Michigan, it is said $7,000 were extorted. But after a little the farmers got their eyes opened, and began to show fight; and just in proportion as the rural backbone stiffened, the agent weakened. Not a single case was brought in court; not a dollar was collected after the farmers took this stand.

We do not know that this case bears any analogy to the one named above, but it seems to us that it does. In any event, let the people unite in this matter; and if these men want the law, let them have it in every township. The fact, as reported in the papers, that the Minnesota Legislature last winter appropriated $7,000 with which to fight the drive-well men, would lead us to suppose that there are two legal sides to this question and only one right side.—*Prof. Shelton.*

THE *Inter-Ocean* calls attention to the fact that the leading philologists of this country and England are in favor of reforming the spelling of the English language. The conviction that it will be done, sooner or later, is now so general that it is safe to predict that those now living will see the present system generally abandoned in favor of the new.—*Nationalist.*

Notes on Colorado.

Persons making the tour of Colorado and her mountains receive vastly different impressions of the youthful State and of her probable future, according as one or another of her many attractions and her various resources most engage attention. To derive the greatest benefit, nothing must be neglected. Agriculture sustained by irrigation, stock-raising, mining interests, health resorts, mineral and hot springs, beautiful parks, imposing peaks, grand canyons, magnificent falls, lovely mountain towns,—all claim due attention, and all bountifully reward the visitor for his pains.

In crossing the plains, an occasional antelope or a prairie-dog town ceases, in time, to break the monotony. But, on nearing Denver, an ill-defined, smoky bank appears above the horizon. From a state of listless quietude all becomes excitement, in the desire to get the first possible glimpse of the Rockies, unsatisfactory though it be.

Denver, the metropolis of Colorado, is pleasantly situated, at a distance of about fifteen miles from the mountains; but, judged by a Kansas standard, the mountains are about two miles distant, though appearing unaccountably hazy. Much of the deception is doubtless due to the difference in the atmosphere; but may it not be largely due to the fact that no objects so large as these have been seen before. Since the magnitude of the retinal image, the muscular effort in focusing the eye, and the degree of convergence of the axes of the eyes, are factors in estimating distance, it is obvious that the mind might attribute to short distance that which is due to unusual size. The want of distinctness still remains to correct our estimate, but we always see the mountains enveloped in "smoke" and have a sufficient apparent cause for the indistinctness. I was led to these reflections by noting that in going from a town in the valley toward the mountains, there was no such great deception in looking back to town as in looking on to the mountains.

The systems of irrigation were of great interest to me. The wild grass was parched and sear, but gardens and fields were green and luxuriant. Wild torrents which, while coursing their way through their picturesque canyons, seem only designed to give pleasure to the beholder, are made to pay tribute to Ceres. From the mouth of almost every canyon may be seen, winding back and forth to suit the inequalities of surface, bands of verdure which mark the course of ditches conveying water to irrigate farms a score or more miles away. It is well known that by keeping the soil in just the right condition, even in countries having an average rain-fall, a yield may be procured greatly in excess of that obtained under the ordinary vicissitudes of climate.

But it may seem that it would be expensive to irrigate a farm. The main ditches are owned by a company. The water is measured by permitting it to flow through a box of a given cross-section. The farmer pays, for the season, a certain price per square inch of the above-mentioned cross-section. In many places a farm can be irrigated during the whole season at an expense of from fifty cents to one dollar per acre. How many times would our Kansas farmers have given this amount for one good rain! It is now the mooted question whether the water should be admitted to the lowest or to the highest ground first. Their lately-organized Agricultural College will be called upon by the farmers to settle the matter by experiment.

At another time I shall speak of the mines, and more especially of the famous mining camp of Leadville.—*Prof. Failyer.*

THE INDUSTRIALIST.

SATURDAY, SEPTEMBER 6, 1879.

Instead of the usual circular or catalogue, we send the Industrialist to those desiring information about the Kansas State Agricultural College. We would call attention to the articles headed "Departments of Instruction," "Industrial Education," "Special Advantages," and "Directions to Applicants." If further information is desired, address Agricultural College, Manhattan, Kansas.

W. C. Stewart, Harry Rushmore, and Sam Morgan were among the College visitors this week.

Prof. Popenoe is at Topeka packing his large collection of objects of natural history. They will be a valuable addition to the cabinet of his department.

A circular from the officers of the Normal School, at Emporia, announces that a new Faculty has been appointed, and that the next term will begin Sept. 17th.

The first meeting of the Webster Literary Society, for this term, will be held in Telegraph Hall, Saturday evening, Sept. 13th, at 7:30 o'clock. Everybody welcome.

The Alpha Beta Literary Society will meet in the College Chapel, Friday afternoon, Sept. 12th, at two o'clock. All new students are invited to be present. Ladies especially invited.

In another place will be found the names of some of the new students and the counties from which they hail. There are so many new arrivals that we find it impossible to obtain their names for this week's issue. Let them come.

We are exceedingly obliged to the students who are furnishing the INDUSTRIALIST with interesting letters from their respective localities. We know Mr. Salter's "notes" will be appreciated, and we expect Mr. Sikes to give us something spicy. Mr. Morrow is the next one on our list.

District boards about to issue school bonds are invited to correspond with us before negotiating elsewhere. We pay par for first-class 7 per cent bonds, issued upon our blanks. Bonds drawn on our blanks are not transferable, and hence may be safely sent by mail at letter postage. Blanks furnished free of charge on application to M. L. Ward, Loan Commissioner.

The fall term begins next Wednesday morning. The first bell will ring at half-past eight, the second at nine, at which time the students will assemble in the chapel. The first day will be devoted to the enrollment and assignment of students, and probably no recitations will be heard until Friday. We have every reason to believe that there will be a large attendance, and we hope to make the year a pleasant and profitable one to all.

The following new and old students have already arrived. A number of others are on the road and will be here to-day or to-morrow: *Greenwood county*—John Long; *Anderson*—Charles F. N. Clark; *Montgomery*—Mr. Lender; *Johnson*—Miss Eva Couse; *Wilson*—Noble A. Richardson; *Cowley*—Charles Messenger; *McPherson*—Miss Walden; *Massachusetts*—L. E. Hobbs and Charles W. Moore; *Miami*—Chas. Cassteel; *Clay*—Miss Selma Ehrsam; *Cherokee*—Chester H. Packenham, Charles A. Packenham, Noah T. Harvey, George W. Boles; *Barton*—F. H. Prescott and L. F. Gault; *Brown*—F. M. Walters.

Johnnie Lewin, the little Englishman who attended the College for three years previous to the last, died very suddenly on Sunday, August 24th, at his home near Wakefield. He was attacked by bilious colic and died in a few hours. This sad news will be received with sorrow by all who knew kind-hearted Johnnie. While here he endeared himself to all our hearts by his genial ways and christian character. For some months Johnnie had been looking forward to a visit to his native land, where he might enjoy the society of the friends of his childhood; but he has been called to another and better country, one of which he loved to speak and for which he was well prepared. He was one of the Master's lambs.

Mr. R. Demmler, a civil engineer from Chicago, made us a call on Monday morning last. Mr. D. is making a tour of the State in the interest of some capitalists who desire to locate several thousands of acres in one body, suitable for stock-raising on an extensive scale. At his request we gave Mr. Demmler our publications. From Topeka he sends us the following note: "Will you allow me as a comparative stranger to express to you my thanks for the great pleasure which the perusal of the 'Hand-Book' has afforded. A better policy than the one laid for your College could, in my opinion, not be framed; and the accommodations and facilities for practical study and work which you offer to students are undisputably of a most excellent kind."

RANDOM NOTES FROM SALTER.

THAYER, Kas., Sept. 1st, 1879.

Editors Industrialist:—In compliance with the request contained in the INDUSTRIALIST of August 23d, I will proceed to be "heard from." I am not desirous of obtaining notoriety as a correspondent, but I am willing to do my share toward keeping up the present student correspondence in your paper. I have been deeply interested in the letters already published, and hope to see many more.

In regard to myself, I can say that I have spent a very pleasant vacation, and am now "located" on my father's farm, situated four miles northeast of Thayer. I will generally be found at home, and will be very glad to see any College friends who may stray through these parts. Have rented the farm, together with stock, teams, and farming tools. To satisfy the curiosity of the inquisitive, I might state that I have hired a man and his wife by the year, for an indefinite period, and that my present mode of living is proving very satisfactory as compared with "baching." In regard to "that barn," I will say, for the benefit of Mr. Rushmore, that its erection is only a "question of time." A bill of the necessary dimension lumber having been sawed, is partly on the ground; and the hauling of the necessary stone for the walls, I have laid out for my winter's work. The work will not be commenced until next spring.

As to country, I can say that we have beautiful scenery here in southern Kansas,—beautiful, at least, to the practical farmer and stock-grower. The gently rolling prairies, covered with luxuriant grass and grain, checked here and there by the timber line of some water-course, presents to his eye a world of wealth. I think that in the near future we will have added to these "beauties of nature" those works of art so necessary to a prosperous farming community,—good, substantial farm buildings. With these will come a better grade of stock and a more thorough system of cultivation.

During the last few years that class of persons peculiar to the frontier, who find more time to grumble than they do to work, are taking the advice of Horace Greeley and are "going West." In their places the country is receiving an immigration of live, practical men, from the Eastern States, who come to make *homes* as well as a "living." I say that Kansas has glorious prospects before her!

Who next? Very truly, yours,

LEWIS A. SALTER.

NATIONALIST ITEMS.

Clarence Wood is in eastern Kansas visiting friends.

George Perry, who has been sick, is able to be around again.

S. M. Fox has moved into his new store, and his goods are very tastefully displayed.

At last the Kansas Pacific has made a substantial walk from Wyandotte Avenue to the depot.

The citizens met Saturday at the office of J. Q. Sheldon and organized to oppose the drive-well monopoly.

Dr. Reynolds, of Ft. Riley, will preach the annual sermon before the Young People's Christian Union, Sunday, September 14th.

Col. John B. Anderson has purchased the six lots south of Mr, Purcell's, three on Pierre and three on Colorado street,—on which he intends to build.

Our reporter was mistaken as to Mr. Higinbotham's intentions to build on the old lumber-yard lot, but he has contracted with Wm. Smith, for Mrs. Shortridge, to have a building like Fox's erected immediately west of Knostman's. Work has already commenced, and the lower story is to be ready for occupancy in sixty days.

SPECIAL ADVANTAGES.

We enumerate a few of the special advantages which the Agricultural College presents to the young people of the State of Kansas:

First: Although an industrial school, as thorough and as complete an education—using the term in its popular sense—can be acquired here as in other schools. A student will make as rapid advancement here as elsewhere in the studies pursued, whether he remains here one or two years, or through the whole course.

Second: While obtaining a knowledge of English, mathematics, and the natural sciences, every student is learning some useful trade or art. This peculiar feature of the Agricultural College is a success. It should no longer be regarded as an experiment. Those who have been here one, two or three years are now in good positions, receiving good wages as telegraph operators, printers, carpenters, etc. Young men who have been through the course in practical agriculture and horticulture are rapidly becoming known as the best farmers in the localities in which they reside.

Third: The expenses are brought down to the lowest possible point. There are no matriculation fees, no tuition bills, no college customs, which compel a useless expenditure for badges or dress. The expenses are simply the cost of living, and the text-books used.

Fourth: The high moral and religious influence which exists at Manhattan. The students of the Agricultural College are young men and women of excellent character. Their average age is about eighteen years. They are deeply in earnest in their efforts for advancement. Of course there are a few exceptions, but the vicious or shiftless are soon thrown out. "Attend to business or leave" is the one rule. A wholesome religious influence pervades the Institution. The students' weekly prayer-meeting has been well sustained for more than ten years.

DIRECTIONS TO APPLICANTS.

TERMS OF ADMISSION.

Candidates for admission must be fourteen years of age, and pass a satisfactory examination in reading; arithmetic, through decimal fractions; and English grammar, to syntax. Classes are started at the beginning of each year in Drill in Arithmetic and Drill in English; and the pupil must have the knowledge above indicated, else he will be unable to retain position if admitted.

Pupils will be received at any time during the year, if able to pass an additional examination upon the subjects studied by the classes which they expect to enter. But they will find it greatly to their advantage to be present at the opening of each term, or as soon thereafter as possible.

GRADES.

Both the Literary and Industrial recitations are graded daily upon a scale of 100; and an examination of all classes is made at the close of each month. A student not attaining an average grade of sixty is promptly dropped to a lower class, or excluded from the Institution until able to do so. The work of grading is strict and uniform in all the departments, and this process is rigorously used for sifting out incompetent and indolent pupils; thus more than accomplishing all that is designed to be effected by a "high standard of admission." Hence, the student's continuance in the College wholly depends upon his own action.

The course is based upon the determination to make the labor required in the preparation of one industrial and three literary recitations as much as the average student can perfectly perform, in ten hours a day. We design to give the pupil the worth of the time expended at College; and, in order thereto, he must do a full day's work with brain or hand. Only those students who can maintain a standing of ninety in each study will be allowed to take more than the prescribed number of recitations; and no one will be permitted to have less than one industrial and three literary recitations.

RELIGIOUS.

Unless otherwise directed by parents, students are required to attend chapel at 8:30 A. M. on academic days, and divine service once every Sabbath.

EXPENSES.

There are no charges whatever for enrollment, attendance or instruction in the regular courses; nor are there any "contingent fees" for the repair of buildings, for the use of books or apparatus, for diplomas, or the kindred privileges usually grouped under the term "contingent." Male students are furnished instruction, the use of apparatus, instruments or tools, in both the literary and industrial classes marked out for them, without any charge. And the same is true of female students in the regular classes provided for them. Printing and Telegraphy are industrials primarily provided for the education of female students, and male students taking either of these are charged $1 per month for use of instruments.

Instrumental music is a fine art or "accomplishment," rather than a mechanical art. We do not place it among our "industrials" in the same sense, or for the same purpose, that we do those provided for teaching the trades. Accordingly the following fee is required from female students for tuition and the use of instruments:

Terms per week:

Private lessons, 2 a week, on any instrument, $1.00
Private lessons, 1 a week, on any instrument, .60
Class lessons, 2 a week, on any instrument, .65

Instruction in harmony, etc., etc., from ten to fifty cents per week, as the student may or may not be in other classes.

The only charge made for material in either the literary or industrial departments is for the chemicals used by students in laboratory practice, which are furnished at wholesale prices, and amount to but a small sum.

Furnishing an absolutely free education is as much as can be reasonably asked; and the Institution neither boards, clothes, nor supplies the student with text-books. Boarding can be obtained in private families at from $2.75 to $4 per week. Washing costs from seventy-five cents to one dollar per dozen. Text-books, which can be procured in Manhattan, cost from $2 to $5 per term.

No student need expend over $5 per week; and many of our best pupils are living at $1.25 per week. Students desiring to "board themselves" can do so at from $1 to $2 per week. In a club of four young men, renting a house, the average cost to each for the term was $1:11 per week.

LABOR.

Manual labor by the students may be for either of two purposes: First, to acquire skill in a given art; second, to earn money. In the first case, the labor is educational; in the second, it should be paid for by the party benefited.

Educational Labor.—Manual labor in the recitations of the Industrial Departments, like mental labor in those of the Literary Departments, is purely educational and will not be remunerated. While the interest of the student will be held paramount in the direction of this labor, the practice necessary to dexterity will be required.

Remunerated Labor.—When the Institution needs labor on the Farm or elsewhere which is not educational, but simply for its own profit, and which a student is able and willing to perform, it becomes an employer instead of a teacher, and he an employe instead of a scholar. It pays for work, he works for pay. The relation between them is commercial, not educational; and both parties must act upon business principles. Hence, the College furnishes only such employment as its own interests require, and will pay according to the value of the service rendered at from seven to ten cents an hour.

AMOUNT EARNED.

It is impossible to predict how much a given person can earn, since that depends upon what he can do and what work there is to be done. Hence, it is wholly impossible for us to answer the question so often asked: "Do you think I can meet my expenses by work?" Some students make one-half their expenses, some the whole, and exceptional men have made more than expenses. As a rule, a faithful boy skilled in farm work can earn half his expenses on the Farm or in the Nursery. During the year he can ordinarily acquire sufficient skill in the wood or iron shops to enable him to make articles for sale. The whole question is one for his own consideration and decision. We can teach all who come, but cannot absolutely *promise* anything more. Hitherto we have refrained from holding out strong inducements respecting the amount of labor we might have to offer; but in view of the fact that during each of the last three years we have had more to do than the students could perform, we are inclined to give greater and positive encouragement on this point. Any boy who is in dead earnest, who is familiar with farm operations, and who can raise $50 to start with, should be able to carry himself through the four years' course. And certainly this places an education within the reach of every determined boy. As yet we are unable to offer similar advantages to girls, not requiring labor in the College departments which they can perform.

RULES.

1. Behave as a true man or woman should, at all times and in all places.

2. Attend to your own business promptly, thoroughly and courteously; and vigorously let alone that of other people.

3. Penalty: "Leave!"

PUBLICATIONS.

The "Hand-Book," published in 1874, containing a full discussion of the educational question and the aims of the Institution, will be forwarded to any one desiring it.

THE INDUSTRIALIST, a weekly journal edited by the Faculty and published by the Printing Department, contains original and seasonable articles on the Farm, Orchard, Trades, Sciences, and Education. Price, 75 cents a year. Address A. A. Stewart, Manhattan.

CALENDAR.

Fall Term, 1879.—Will begin Wednesday, September 10th, 1879, and close December 18th, 1879.

TO NEW STUDENTS.

Bring the text-books you have been using. On arrival, first arrange for your boarding. A. A. Stewart will furnish information, either by letter or on application, concerning boarding places or rooms for rent. Report to the President at 8:30 A. M., immediately after chapel exercises, for enrollment.

For further information apply to Jno. A. Anderson, President, Manhattan, Kansas.

RAILROAD TIME-TABLE.

KANSAS PACIFIC RAILWAY.

PASSENGER ARRIVES.

No. 2, going East..... 11:58 A. M.
No. 4, going East..... 3:28 A. M.
No. 1, going West..... 4:03 P. M.
No. 3, going West..... 4:51 A. M.
No. 7 (freight), going West..... 8:45 A. M.

Nos. 1, 2 and 7 run daily. No. 3 runs daily except Monday. No. 4 runs daily except Sunday. Passengers with tickets are carried on No. 7.

GEO. C. WILDER, Agent.

THE INDUSTRIALIST.

SATURDAY, SEPTEMBER 6, 1879.

Industrial Education.

The real value of an education to the student depends upon two things: First, the practical worth of the knowledge taught; and, second, the degree in which he makes it his own. Hence, the ability of any institution to give a practical education depends upon the kind and aim of the knowledge it teaches, and upon the thoroughness of the instruction therein. The State Agricultural College was directly endowed by Congress, and is guided by the State, for the specific purpose of furnishing to the industrial classes of Kansas a "practical" education, that is, "one fit for use." As its name indicates, and as the statistics of the industries of the State require, its chief work must be that of giving a useful and usable education to those who will engage in farming; and, therefore, the Farmer's Course must, from the nature of the case, be its main one.

FARMER'S EDUCATION.

Words and figures are merely instruments with which to record ideas. They are not themselves ideas, nor should they be made the chief end of an education. As a wagon is necessary to haul grain, so are they a necessary part of an education; but as the wagon is not the grain, so they are not the knowledge which the farmer converts into money. Hence, the classics and higher mathematics are not taught. But it will be noticed in the following course that so soon as the pupil acquires working skill in the use of the English language as a tool, and of figures and lines as mathematical tools, those arts and sciences which present knowledge that has a cash value to the farmer are taught as rapidly as their importance and thorough acquisition will permit. Studies numbered (1) and (4) in the second, third and fourth years are the spine of the course, to which the others are as ribs and muscle.

FARMER'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Practical Agriculture (advanced.)	1. Drill in English.	1. Botany, Entomology.	1. Drill in English.	1. Physiology.	1. Physiology.	1. Drill in English.	1. Drill in English.
2. Geology, Mineralogy.	2. Geology, Mineralogy.	2. Inorganic Chemistry.	2. Drill in Arithmetic.	2. Rhetoric.	2. Rhetoric.	2. Drill in Arithmetic.	2. Drill in Arithmetic.
3. Polit. Economy, Practical Law.	3. Polit. Economy, Practical Law.	3. Practical Geometry.	3. Industrial Drawing.	3. Algebra.	3. Algebra.	3. Industrial Drawing.	3. Industrial Drawing.
4. Zoology.	4. Zoology.	4. Horticul., Landscape Gardening.	4. English Structure.	4. Practical Agricul. (elementary).	4. English Structure.	4. English Structure.	4. English Structure.
5. Agricul. Chemistry Meteorology.	5. Agricul. Chemistry Meteorology.	5. Organic, Analytical Chemistry.	5. Adv'd Arithmetic, Book-keeping.	5. Physics.	5. Physics.	5. Adv'd Arithmetic, Book-keeping.	5. Adv'd Arithmetic, Book-keeping.
6. Logic.	6. Logic.	6. Practical Surveying.	6. U.S. History, Industrial Drawing.	6. Industrial Drawing.	6. Industrial Drawing.	6. U.S. History, Industrial Drawing.	6. U.S. History, Industrial Drawing.

WOMAN'S EDUCATION.

Nearly one-half of our students are females, and the Woman's Course is prepared expressly for their liberal and practical education. We have no doubt whatever that practical men and women, who understand what it means and what it seeks to do, will fully endorse it.

WOMAN'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Farm Economy, Special Hygiene.	1. Drill in English.	1. Botany, Entomology.	1. Drill in English.	1. Physiology.	1. Physiology.	1. Drill in English.	1. Drill in English.
2. Geology, Mineralogy.	2. Geology, Mineralogy.	2. Inorganic Chemistry.	2. Drill in Arithmetic.	2. Rhetoric.	2. Rhetoric.	2. Drill in Arithmetic.	2. Drill in Arithmetic.
3. Polit. Economy, Practical Law.	3. Polit. Economy, Practical Law.	3. Industrial Drawing.	3. Industrial Drawing.	3. Algebra.	3. Algebra.	3. Industrial Drawing.	3. Industrial Drawing.
4. Zoology.	4. Zoology.	4. Horticul., Landscape Gardening.	4. English Structure.	4. English Literature.	4. English Structure.	4. English Structure.	4. English Structure.
5. Phys'c'l Geography, Meteorology.	5. Phys'c'l Geography, Meteorology.	5. Organic, Household Chemistry.	5. Adv'd Arith., Book-keeping.	5. Physics.	5. Physics.	5. Adv'd Arithmetic, Book-keeping.	5. Adv'd Arithmetic, Book-keeping.
6. Logic.	6. Logic.	6. Household Economy.	6. U.S. History, Industrial Drawing.	6. Industrial Drawing.	6. Industrial Drawing.	6. U.S. History, Industrial Drawing.	6. U.S. History, Industrial Drawing.

MECHANIC'S EDUCATION.

Because of the adaptedness of the leading course to the wants of the intelligent mechanic, it has been found practically unnecessary to diverge from the Farmer's Course. Additional studies, specially adapted to the mechanic's use, will be furnished in a Post-Graduate's Course.

If it be urged that the distinctively agricultural knowledge taught in the Farmer's Course is not directly valuable to the mechanic, we reply that, admitting the point for the purpose of argument, yet: 1. This knowledge is of more practical value to the mechanic than is the Latin, Greek, or a half dozen other things embraced in the usual course preparatory to the professions; 2. That the great majority of Kansas mechanics will also be more or less engaged in agriculture; 3. That those studies in the course which are directly valuable to the mechanic, together with the shop facilities, offer a better mechanic's education than can be elsewhere found west of the Alleghanies.

INDUSTRIAL DEPARTMENTS.

Having knowledge in the head is one thing; ability to use it with the tongue, fingers or feet is quite another thing. Both are vital to success in practical life. A man might thoroughly understand the theoretical principles of carpentry, and yet, not having used the tools, be wholly unable to earn carpenter's wages. So in all other vocations. Accordingly, instruction is given in the following well-equipped Industrial Departments, and every student is required to recite in some one of them, as selected by the pupil or parent:

FOR MALE STUDENTS.	FOR FEMALE STUDENTS.
The Farm.	Dress-making.
The Nursery.	Printing.
Carpentry.	Telegraphy.
Cabinet-making.	Scroll-sawing.
Turning.	Carving.
Wagon-making.	Engraving.
Painting.	Photography.
Blacksmithing.	Instrumental Music.

Each of these departments is conducted exactly as in daily life, and aims to give precisely the drill received by an apprentice. No charge is made, either for tuition or material, from male students taking the Industrials provided for them; nor from female students taking the ones provided for them, except in Instrumental Music. Male students taking either Printing or Telegraphy are charged $1.00 per month for the use of instruments and material.

DEPARTMENTS OF INSTRUCTION.

DEPARTMENT OF AGRICULTURE.

PRACTICAL AGRICULTURE.

Second Year:—General principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage.

Fourth Year: General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of a rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farmhouses; barns.

FARM ECONOMY.

Woman's Course, Fourth Year: Dairy products as human food; influences affecting character of milk; manufacture of condensed milk; the factory system and household plan of cheese-making; treatment of rennet; general process of cheese manufacture; subsequent treatment of cheese; butter-making; creameries; "deep" and "shallow" setting systems; general process of butter-making; packing and preserving butter.

DEPARTMENT OF BOTANY AND PRACTICAL HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest; also a course of lectures on Landscape Gardening. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard; fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture; shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in in the work of laying out and plotting grounds topographically.

CHEMICAL DEPARTMENT.

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life. Text-book, Ganot.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blowpipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

Are constantly in progress in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

DRILL IN ENGLISH.

"As grammar was made after language, so ought it to be taught after language."—*Herbert Spencer.*

Drill in English embraces the following topics:

Sounds of the language; drill in producing the vocal, sub-vocal and aspirate elements with accuracy, distinctness and volume; vowels, consonants.

Letters: Form; power; rules for spelling, drill.

Words: Signification, properties, modifications, variations, relation and dependence.

Sentences: Drill in statement of ideas; description, clearness, terseness, vigor; business letters, discussion; capitalization; syllabication; punctuation; construction and analysis of sentences; elements, uses and names; criticism of compositions printed as written; proof reading; grammatical construction; superfluous words and clauses; drill in reading, speaking and penmanship.

Text-books: Webster's Academic Dictionary; Lee & Hadley's Advanced Lessons in Language.

Pupils deficient in spelling, etc., should enter the printing class, the printing-office being the work-shop of language.

STRUCTURE OF ENGLISH.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

MATHEMATICAL DEPARTMENT.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

DRILL IN ARITHMETIC.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Following this line, the student, so far from hammering away at "pure" science draws from the mathematical store-house what he needs, and sees why he needs it. Accuracy of calculation and posting, rather than a *mere* comprehension of the principles, is aimed at. Besides the recitation-room drill in business forms, practice in the field is also given. Estimating the number of cords in a pile of wood said to be 100x4x4 feet is one thing; measuring a pile of wood through which any number of cats may be harmlessly thrown, and in which four-feet sticks are the exception, is quite another and more difficult thing.

ARITHMETIC AND BOOK-KEEPING

Is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides ensuring arithmetical practice, develops practical skill in that important art.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admiral system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study. In addition, constant practice in the application of lines to metal and wood is furnished in the Blacksmith, Carpenter, Turning, Scroll-sawing, Carving, Engraving and Printing shops, and to fabrics in the Sewing Department.

PRACTICAL GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the use of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

PRACTICAL SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

STUDIES SPECIAL TO WOMAN.

Besides the studies already indicated, attention is called to the following:

SPECIAL HYGIENE.

As shown in the course, one term is devoted to the study of Physiology, from the text-book of Dr. J. C. Dalton. This is followed in the fourth year by a course of lectures to young ladies by Mrs. Cripps on the subject of Hygiene, embracing such instruction in hygienic matters as are valuable to woman.

FARM ECONOMY considers those affairs of the farm which usually come under the supervision of the farmer's wife or daughter, and which are not included in "gardening" or "household economy;" such as butter and cheese-making, dairy management, etc. A course of lectures is delivered by the Professor of Practical Agriculture. See heading, "Farm Economy."

GARDENING is included in Practical Horticulture. See heading, "Landscape Gardening."

HOUSEHOLD CHEMISTRY. See heading, "Household Chemistry."

HOUSEHOLD ECONOMY

Follows Household Chemistry and consists of lectures by Mrs. Cripps on the art of house-keeping, embracing cookery, domestic management, and kindred topics. Many elderly gentlemen sufficiently know, and more young gentlemen will duly discover, that systematic knowledge of how cooking ought to be done is luminously different from the ability to do it. Instruction without practice can effect but little. Accordingly, a kitchen laboratory has been completely furnished, and affords every facility for drill in the art of cooking. This drill chiefly differs from that of a kitchen in the respect that after a girl has learned to wash dishes or pare potatoes she is not kept everlastingly at either. After full trial, we have found it just as feasible to give this practice, with profit and pleasure to the pupil, as it is to give laboratory practice in chemistry,—and no more expensive.

Printing!—Daily instruction and drill in the work of a First-Class Printer. The Literary Departments offer a thorough education in the construction and use of the English Language, as employed by the Proof-Reader; in Book-Keeping; and in Industrial Drawing, as the best developer of that taste necessarily exercised by every good Job Printer. The Printing Department is well furnished with all the facilities for a speedy mastery of the art of Printing, and is in charge of a practical printer. Besides regular class instruction in printing, the weekly publication of the INDUSTRIALIST by the Department furnishes advanced students the requisite drill in newspaper work.

THE INDUSTRIALIST

VOL. V. MANHATTAN, KANSAS, SATURDAY, SEPTEMBER 13, 1879. No. 22.

THE INDUSTRIALIST.

Published every Saturday by the
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OF THE
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Farming and Education.

Whatever croakers may say, the rolling years are slowly but surely bringing forth progress in many essential departments of human interest. As experience utters its unanswerable voice, error grows less confident and gradually disappears, while the right and the best win popularity and secure the approval and patronage of the intelligent and influential.

It is but a few years since the opinion prevailed, in a large part of our country, that agriculture required but little information and mental training for its successful conduct; that an educated man ought not to waste his talents in so plain and humble a calling; and that it was compromising to personal dignity for one to identify himself with the common duties of the tiller of the soil. Now, it is clear that there is a very great demand for brain as well as muscle in performing the duties of the farm. The difficulty is found to be in the want of sound judgment,—of fertile minds as well as acres, of power to promptly and economically utilize discoveries and improvements.

There is now a general desire in the highest educated circles to devise the best methods for preparing our young men for the calling that supports all other callings. Hence our agricultural colleges. While the problem is hard to solve, it is evident that the extraordinary attention to the higher departments of instruction in industrial pursuits, is rapidly strengthening, enlarging and enriching the minds of those who are entering the occupation of the farmer. The farmer has long been working for the world unappreciated; but now the world is turning to most earnest work for the farmer. So far from the educated man feeling himself above the grand old calling, he is now, in multitudes of instances, toiling with his mighty talents to give more success to those who pursue that avocation.

It is highly complimentary to farming, that while few farmers leave their plain work for complete or continued devotion to any one of the so-called learned professions, there are many, very many, of those who profess to be devotees of one of those professions who gladly and persistently add the pleasure and security of farming to their special work. It is not merely Anglo-Saxon love of land;—it is an intuitive conviction of what is the most trustworthy of merely human possessions. Farming, elevated, directed and constantly improved by advancing knowledge is, in a large degree, the hope of the continued prosperity and progress of our country.—*Rural New-Yorker.*

THE time of holding the annual school election is the middle of August, about two weeks before the opening of schools. At this meeting the length of term, amount of tax, and the all-important question of teacher are acted upon. Few district boards will hire a teacher until after the annual meeting, as it deprives the new member, then to be elected, of having a voice in the matter. What objections there may be to having this annual meeting the last of June or first of July we do not know; but we do know that the present working of the law results in driving many of our best teachers out of the profession. Teachers' wages are not very high, and most good teachers are qualified to fill other positions. When they close their schools in June they seldom know where they will teach, or whether they will succeed in getting a school of any kind or not until after the middle of August; and rather than wait on this uncertainty they accept some other position, often at lower wages but not attended with so much uncertainty, and inferior teachers take their places.—*Harper Times.*

Education in the Kitchen.

The *Popular Science Monthly* raises a shout of thanksgiving that education is at last beginning to reach the kitchen. Cooking schools are springing up in many places in this country, and the Scotch and English are taking the lead in organizing them as part of their national and common-school system. We abound in female seminaries and female colleges, high schools and normal schools, in which everything under heaven is studied except that practical art which is a daily and vital necessity in all the households of the land. Our kitchens are the fortified entrenchments of ignorance, prejudice, irrational habits, the rule of thumb and mental vacuity; and the result is that Americans suffer beyond any other people from wasteful, unhealthful, unpalatable and monotonous cooking. We have long professed to believe in the potency of education, and have not been slow to apply it to all other interests aud industries excepting only the fundamental art of preparation of food to sustain life, which involves more of economy, enjoyment, health, spirit and power of effective labor than any subject taught in our schools.—*Exchange.*

Cultivate Well.

Every farmer wants an orchard. All who deserve the name plant them, but, once planted, too many think that the trees can take care of themselves. How many would expect to succeed thus with a farm crop of any kind? Then why with trees? Take a lesson from nature. Do we see a good wildling tree thrive and bear good crops of any fruit, unless it has good natural advantages? No! Why then expect that improved varieties should do so? We see wild blackberries thrive where they spring up beside some fallen tree in the edge of a grove, or in some opening of the forest. The wild crabs bear superior fruit about hazel patches where they are secure from the trampings of animals; and along steep banks the haw, wild plums and other fruits are in perfection, simply because in these situations they have the best advantage that nature can give them. Why, then, may the farmer, who should make it a point to raise everything the soil will produce for the comfort of his family, expect to succeed with fruit under conditions that every pomologist knows will cause failure? There can be but one answer: he holds fruit to be something which, if it takes care of itself, well and good. If not, he goes without it, or buys it in the market. His failures lead him to believe that fruit is running out. It does not do as well as when he was a boy. The fact is the average farmer of to-day does not care for his orchard as did his father before him. His orchard is quickly seeded to grass and used for pasture. The young trees are torn and twisted, and if they escape other destruction they grow up gnarled and bear only inferior fruit. Yet experience has demonstrated all over the West that a liberal supply of fruit may be had in all seasonable years if only as good care be taken of the trees and plants as he gives his corn crop.

We do not believe in renovating old orchards, except it be to bring them into bearing until new and healthy trees may be grown. We do not believe in the profits of orchards fifty years old. We had rather, in the West at least, have the first ten crops of apples than all the succeeding crops the orchard will bear, and this even on the score of economical cultivation. It is nonsense to think that they do not do as well as formerly. They are subject to more contingencies than when the country was new. So are all other crops. The spread of insect enemies and *fungii* must be combated. This the farmer does with his field crops, and the fruit-grower does the same with his orchard. He cultivates his trees as carefully as the farmer does his crops, and succeeds.

We do not advocate that the farmer should endeavor to raise fruit for the market. This had better be left to the experienced fruit-grower; but we do advocate that every farmer should have an orchard, a vineyard, and a small fruit garden, fully sufficient to supply the wants of his family. The time to think about getting ready for this is now. When you visit the fairs observe the fruit on exhibition. Try to learn some of the varieties, so you will again know them when you see them. Make up your mind what you want, and send the order to some respectable nurseryman this fall, and send it early. Do not depend upon itinerant tree peddlers. If you know your man and know him to be the regularly-authorized agent of a reputable nurseryman, well and good, go ahead; but do not be gulled by ever-bearing varieties from the exhibition, florid pictures that exist only in the imagination of the individual—we will not say artist—who got them up. If you have not already an orchard, set about getting one at once. If you have a dilapidated orchard, set about planting another, and once planted, take care of it. It will pay.—*Journal and Farmer.*

A WOMAN'S education is commenced as soon as she can lisp her mother's name, and it ends not until she hears at last the words so welcome from the Master, "She hath done what she could." If properly taught by an educated mother, the girl who receives the right training in the schools and colleges will not waste her life. She will not go like a ponderous engine over a long route, dragging one car when she can just as easily take a dozen. She will so utilize her powers and forces around her that she will accomplish more in one day with much less labor than another will do in a week, aye in a lifetime. Look at this on a small scale. Who had not rather have one servant girl with thought and brain power than two or three who can do only as work is planned for them? The woman who loves books, flowers, and "prefers higher thoughts to lower thought" lives a happier, easier life than a mere mechanic, a drudge who toils and spins from early dawn till late at night; but that, in any way, the latter is the best home keeper I deny.

I know poor women who spend time and thought and energy and power enough over the making over of old dresses, and the scrubbing of the kitchen floor, and the baking of needless pies and pastries, to in one year read through a good-sized library. A woman of this order asked a lady, not long ago, who Milton was. Asked the question as she sat putting the third or fourth ruffle on a cheap dress that she was making over. After a reply was given, she said, "Oh, yes, I guess we've got the book; but I don't get no time to read." The truth was, though she did not discern it, she had no taste or desire for books. Such a life seems like a home in a house without a window.—*Mrs. C. F. Wilder, in Central Christian Advocate.*

THE farm fences of the United States are estimated to cost $1,350,000,000, and require $250,000,000 annually to keep them in order. Besides the direct cost of fences, the land which they occupy and render worthless is an important consideration. The zig-zag rail fences, with stakes and riders, on an ordinary farm, occupy five per cent of the land, or five acres in every hundred. In view of this, a straight fence, other things being equal, is the cheapest.—*American Agriculturist.*

THE INDUSTRIALIST.

SATURDAY, SEPTEMBER 13, 1879.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

At the Iowa Agricultural College every girl in the Junior class has learned how to make good bread, weighing and measuring her ingredients, mixing, kneading and baking, and regulating her fire. Each has also been taught to make yeast and bake biscuit, puddings, pies and cake of various kinds; how to cook a roast, broil a steak, and make a fragrant cup of coffee; how to stuff and roast a turkey, make oyster soup, prepare stock for other soups, steam and mash potatoes so that they will melt in the mouth; and, in short, get up a first-class meal, combining both substantial and fancy dishes in good style. Theory and manual skill have gone hand in hand.—*Exchange.*

In our own College the young lady students have long been thoroughly and practically initiated into the mysteries of cooking, the department having been established some three years. With us, all of the above has long since been "a matter of course," and what is more to the point, all of our students are taught to be useful, and take a hand every day at some useful manual labor.—*Prof. Shelton.*

Prof. Phelps, of Winona, Minnesota, in a late number of the *Educational Weekly*, has an article on agricultural colleges. While we dissent from the general tenor of the article, we heartily endorse the ideas in the following extract: "What we want is a gradual system of scientific teaching, beginning in the lower schools, with the more simple elementary truths, and advancing step by step to our high and normal schools, *with that kind of knowledge which is of most worth.* Our industrial classes need an education befitting their condition and circumstances, beginning with their school-days and continuing until they pass into active life."

As nine-tenths of the people follow industrial pursuits, it would indeed seem the sensible thing to put into our school system that which would prepare them for their life work. But, as a general rule, the graduates of our high schools find themselves simply prepared either to teach the same course they have pursued, or to enter upon the university course, which will fit them to study for some profession.

Whatever should enter into the life of the nation should be taught in its public schools, is the fundamental maxim in the Prussian system, and we hope that in time it will be accepted in our own country as a first principle.—*Prof. Ward.*

Sciences in the Public Schools.

It is always found, in attempting to acquire a knowledge of any new subject, that the most difficult part is to make a satisfactory beginning. If the beginning is once made, farther progress is comparatively easy. Illustrations may be found everywhere. We often meet in this country with men of considerable business capacity, men who have accumulated a fortune, and yet cannot even write their names. Little time and labor would give them that much, yet it seems impossible for them to get it. They rather subject themselves to the continuous shame of making their mark, and sign their last will on the death-bed with the cross.

This is not, I believe, an extreme illustration of the inertia of the adult mind: stronger ones could be found. And, if we substitute for the writing of one's name the elements of the sciences necessary in all industrial and agricultural occupations, or drawing — indispensable in the workshop, we at once have the problem of technical education in the common schools before us.

It may be safely asserted that, if all technical instruction is put off until our pupils become workmen, they will never be adequate to the requirements of the age. It is very seldom that adults of average ability and inclination, but without any early technical education, attempt to make themselves, by study, masters of their business. Our farmers, with all the multitude of well-written works in botany, horticulture, stock-breeding, and agriculture, supplemented by long lists of excellent periodicals, do not improve themselves. The reason is simply that they spent their school-days monotonously with drilling in the three R's; and now books and periodicals are only stumbling blocks to them, because they do not understand even the commonest scientific terms, without the aid of which these books could not have been written. A German proverb says: "What Johnny didn't learn, John will never do." No saying, from Solomon to Billings, ever enveloped a greater truth.

It is not as difficult, however, to convince educators that the principles of the sciences should be introduced into the common schools, as it is to convince them that it can be done, and that it would be an educational as well as a practical gain.—*Prof. Walters.*

J. E. Platt writes from Eureka to the Industrialist, the College paper at Manhattan, after a trip from Riley county. He crossed the Kaw Indian Reservation, and mistaking it for an old-settled country, makes the following unjust and unfair comparison of Morris and Lyon counties:

"Morris county, the second below Riley, is a herd-law county; Lyon is not: and as we compared the farms, the buildings, and the improvements of the country in general, in the two counties, as far as thrift and enterprise was concerned, the verdict was not in favor of a herd law."

Had this writer known the history of the country that he traveled through in Morris county, he would not have written such bosh. Five years ago this Indian land had hardly a permanent settler. Now there are hundreds of them with homes that are comfortable. They have yet to buy their land, as soon as it comes in the market. Now, we hope when Mr. Platt writes about another county he may pass through, he will ascertain its past history before writing it down. Certainly there is no more beautiful country in Kansas than this; but because it is new is no reason why it should be compared unfavorably with a country that has been settled for twenty years.—*Council Grove Republican.*

We have not been able to submit the above to Prof. Platt, but in justice to Morris county we print the *Republican's* article in full. The good name of the thriving county will probably not be seriously injured by the Professor's mild criticism, and we are quite certain that nothing was farther from his mind than to do injustice to our near neighbors of Morris county.

We submit, however, that the *Republican's* theory that a writer must "ascertain its (the country's) past history before writing it down" will hardly bear criticism. We should like to know how many travelers or descriptive writers have studied the "past history" of the countries or subjects about which they have written.—*Prof. Shelton.*

George T. Fairchild has been elected President of the Kansas State Agricultural College. Mr. Fairchild is from the Michigan Agricultural College, at Lansing. In this, and in the selection of the Superintendent of the Insane Asylum, at Topeka, the people have evidence that politics do not control the selection of men for such positions in Kansas.—*Wyandotte Gazette.*

The entire assessment of the State foots up $144,800,000, an increase over last year of $6,000,000.

Students Enrolled Since Sept. 10, 1879.

NAME.	COUNTY.
Abbey, Frank L.	Dickinson.
Adams, Emma L.	Riley.
Aley, Frank A.	Chautauqua.
Allen, Albert H.	Nemaha.
Allen, Clara M.	Nemaha.
Allingham, Jessie	Riley.
Anderson, John	Butler.
Ayres, Sarah	Shawnee.
Barnett, Robert F.	Sedgwick.
Bass, Alfred G.	Shawnee.
Bates, Charles W.	Riley.
Bauer, George	Douglas.
Bayles, Rachel M.	Riley.
Bistline, Florence S.	Shawnee.
Boles, Washington	Cherokee.
Bolton, William	Wabaunsee.
Browning, Alice	Riley.
Buchli, Bartholomew	Wabaunsee.
Call, Lewis W.	Shawnee.
Calvin, J. H.	Riley.
Campbell, Bennie	Riley.
Cassteel, Charles	Miami.
Chenoweth, J. W.	Cherokee.
Clardy, Albert	Pottawatomie.
Clark, Charles	Anderson.
Clarke, Mary	Riley.
Coleman, Edward P.	Iowa.
Cook, Ella	Nemaha.
Cook, Henry	Nemaha.
Cook, Rosa	Nemaha.
Copley, Albert	Jefferson.
Corey, William	Shawnee.
Couse, Eva	Johnson.
Cox, Lizzie R.	Riley.
Crawford, Ida	Saline.
De Tar, John A.	Johnson.
Donaldson, Flora	Butler.
Donaldson, George	Butler.
Dow, George H.	Riley.
Dunn, Frank W.	Anderson.
Durkee, Orpheus	Greenwood.
Emert, Timothy H.	Pottawatomie.
Everett, John P.	Miami.
Favour, William P.	Greenwood.
Ferguson, Woods S.	Johnson.
Fisk, William W.	Cowley.
Fowler, George W.	Jefferson.
Gallagher, George B.	Morris.
Gardiner, I. D.	Shawnee.
Gardiner, Lydia P.	Shawnee.
Gault, Lincoln F.	Barton.
Gist, Joseph T.	Riley.
Glossop, Emma	Riley.
Griffing, Mary L.	Riley.
Griffing, William J.	Riley.
Haines, Harvey	Riley.
Harvey, Noah T.	Cherokee.
Himes, Hattie	Riley.
Hobbs, Loren E.	Massachusetts.
Hollenberg, Rudolph A.	Washington.
Hopkins, Harry H.	Butler.
Hopper, George E.	Mitchell.
Hosmer, Mina	Riley.
Hoyt, Emma	Riley.
Hunting, Cora M.	Riley.
Jeffery, Fletcher	Riley.
Jeffery, William J.	Riley.
Kern, Edwin	Jewell.
Kimble, Emma	Riley.
Kinsey, Dora	Shawnee.
Kinsey, Lorena	Shawnee.
Knaus, Warren	Wilson.
Knipe, George D.	Riley.
Knostman, Emma	Riley.
Lawrence, William	Cherokee.
Lewis, Gregg P.	Lyon.
Lewis, Issie	Riley.
Lightfoot, William J.	Jewell.
Limbocker, Clarence	Riley.
Limbocker, Clyde	Riley.
Linder, John	Montgomery.
Lockhart, Orval	Greenwood.
Long, John	Greenwood.
Lowe, Charles	Wabaunsee.
Lyon, Frank W.	Lyon.
Mahaffie, J. F.	Johnson.
Marlatt, Charles L.	Riley.
Marshall, Thomas F.	Johnson.
Mason, Dalinda	Ottawa.
McGuire, Katie I.	Johnson.
McMullen, Orman A.	Cherokee.
McNair, Alice E.	Riley.
McNair, S. E.	Riley.
Messenger, Charles	Cowley.
Miller, Eugene H.	Shawnee.
Moore, Charles W.	Massachusetts.
Moses, Willie A.	Dickinson.
Neiswender, Lincoln H.	Shawnee.
Noland, Manda	Riley.
Packenham, Charles A.	Cherokee.
Packenham, Chester H.	Cherokee.
Paddleford, Solon M.	Riley.
Paine, Edwin C.	Lyon.
Parker, Grace	Riley.
Pattison, Charles	Butler.
Peckham, Almira S.	Riley.
Platt, Henry A.	Riley.
Plummer, Dora	Pottawatomie.
Pomeroy, William G.	Osage.
Pray, Cora A.	Pottawatomie.
Prescott, Frederic H.	Barton.
Quinby, May V.	Clay.
Randel, Alta	Nemaha.
Randel, Henry A.	Nemaha.
Reeve, Mark A.	Lyon.
Reynolds, Theodore	Davis.
Richards, Bettie	Pottawatomie.
Richardson, Noble A.	Wilson.
Robinson, Joseph N.	Shawnee.
Rose, George E.	Cherokee.
Rose, Wm. N.	Cherokee.
Schantz, Willis O.	Jackson.
Sexton, William L.	Sedgwick.
Shaffer, John E.	Missouri.
Shore, Rosa B.	Morris.
Short, Burton L.	Cherokee.
Sickels, Maria E.	Missouri.
Smith, B. B.	Dickinson.
Snow, Cora L.	Riley.
Stiles, Charles H.	Wabaunsee.
Strong, Grace R.	Riley.
Stuart, Jerome	Riley.
Thompson, George F.	Cowley.
Tyler, George K.	Morris.
Vaught, Cora	Butler.
Viles, Emily D.	Iowa.
Wahl, Elbert	Ohio.
Walden, Sarah E.	McPherson.
Walker, James	Cowley.
Wallace, John E.	Davis.
Walters, Frank M.	Brown.
Ward, Milan T.	Illinois.
Whaley, Rowena	Riley.
Whaley, Willie E.	Riley.
White, Perry	Riley.
Whitney, Bertha	Riley.
Wilson, William	Nemaha.
Wingo, S. D.	Jackson.
Woodburn, William	Nemaha.
Woods, Albert O.	Sumner.
Worley, Francis T.	Greenwood.

THE INDUSTRIALIST.

SATURDAY, SEPTEMBER 13, 1879.

Instead of the usual circular or catalogue, we send the Industrialist to those desiring information about the Kansas State Agricultural College. We would call attention to the articles headed "Departments of Instruction," "Industrial Education," "Special Advantages," and "Directions to Applicants." If further information is desired, address Agricultural College, Manhattan, Kansas.

Boom! boom!! boom!!! b-o-o-m!!!!

President Fairchild is expected the last of next week.

The "drouth" came to a most disastrous end on Thursday afternoon, when over two inches of rain fell.

The piece of alfalfa on the lawn has just yielded its fourth crop of hay, a feat which it has accomplished three years in succession.

Mr. Graham, the new Superintendent of the Telegraph Department, arrived on Thursday. He is now busy repairing the lines and adjusting the instruments.

The classes in the industrial departments will be organized Monday. Fifty-six students are already enrolled in the carpenter shop, and are anxious to begin work.

Students continue to arrive, and are being assigned as rapidly as possible. At this writing one hundred and fifty-one names have been registered, the largest number ever recorded during the first week of any term.

Those who complain that the INDUSTRIALIST gives too much space to local matter will certainly be made happy by this number. The truth is, every body on the Hill is trying to do two or three men's work, and don't do it.

Will Sikes came down from Vienna Thursday to see the old students and rejoice over the large attendance this term. He wants his paper sent to Wamego hereafter, because he has been engaged to teach in the public school there.

We have procured a College Register, which will be kept in the INDUSTRIALIST office, and hereafter all who pay their respects to the College—and the INDUSTRIALIST—will have the privilege of enrolling their names in said Register. Each week the list of visitors will be published, as a matter of record, and so that all may know who are our callers.

The INDUSTRIALIST will be furnished to students from now to the close of the College year (in May) for forty cents. It can be obtained at this rate either for themselves or friends. Copies of this issue may be had free of charge, but hereafter none but subscribers will receive the paper, and all others must be contented with reading the number which is regularly placed on file in the reading room.

A great deal of hard work has been done at the College since last Wednesday morning. One hundred and thirty-six students presented themselves for enrollment at that time, and the teachers have been busy examining and assigning them. This work was so systematized, however, that by Thursday evening it was done, and Friday the first regular recitations were held. The classes are all large, and we start off this term with one of the biggest "booms" in the country.

More than two weeks ago we learned of the death of one of our best students, Mr. Thos. J. Wyland, of Smith county. The circumstances were so peculiarly sad that, hoping the report was not true, we have waited for its contradiction. The news has come from so many sources, and is so generally believed here, that we now feel justified in calling attention to it. Mr. Wyland had, for some months previous to his death, been living in a cabin on a homestead which he had taken in Smith county. His portion of the county is so thinly settled that often for many days not a person would be seen. During one of these periods Mr. Wyland was taken sick, died for want of the assistance or relief which loving hands would gladly have rendered, and the fact was not known until some one chanced to call at his cabin three days afterwards. The disease is said to have been small-pox.

To die after life's work is done, surrounded by kind and faithful friends, is sad enough; but to have life's work only begun, with bright prospects ahead, and then be attacked by the destroyer when alone and out of reach of help, and die without a parting word or a single good-bye, is a fate at the thought of which one instinctively shrinks and shudders. This, however, was Mr. Wyland's lot; and while with his grief-stricken relatives we, his College friends, mourn his loss, we sorrow not as those without hope, for he had made the "Good Confession."

The Alpha Beta Society met Friday afternoon for the first time this term. Roll-call showed that about twenty members were present. The following officers were elected: President, George Rose; Vice-President, Gus H. Platt; Recording Secretary, Miss Rowena Whaley; Corresponding Secretary, A. T. Blain; Treasurer, B. B. Smith; Marshal, E. P. Coleman; also, a full set of directors. The members all seemed enthusiastic, and the exercise of extemporaneous speaking passed off lively. An *extempore* debate was indulged in by four of the members. Seventeen persons signified their willingness to join the Society. The Society starts off with brighter prospects than ever before, and no doubt it will be the best Society the College has ever seen. Next week we will be ready to entertain any or all persons who may come. The exercises will consist of debate, reading of the *Gleaner*, extemporaneous speaking, and other exercises to please and profit. Come, then, all new students, and visit the Alpha Beta Society next Friday afternoon. B.

FROM VIENNA--NOT IN AUSTRIA.

VIENNA, Kas., Sept. 10th, 1879.

Editors Industrialist:—I have been much interested in the students' correspondence, and am happy to take my "turn at the mill." The criticism with regard to there being too much local and not enough State news in the INDUSTRIALIST was well met by its editor. It is the local and not the State news which most interests the students; and however much the INDUSTRIALIST may enlarge and improve, we hope it will devote a full share of its space to local news.

We were pleasantly surprised last week by receiving a call from our classmate, C. E. Wood, who was going to see Corwin Reed. He said you were expecting a larger attendance than ever at the College this fall. So mote it be. One young man from this place is thinking of going. He wishes to study telegraphy.

Pottawatomie county will soon vote on the location of its county seat, with a view to permanently deciding the matter. Railroads and railroad bonds are among the principal topics of conversation. The Kansas Central, narrow gauge, whose terminus is now Onaga, on the Red Vermillion, is rapidly extending its road fifteen miles farther west. There is talk of a branch of this road running south from Onaga to Wamego.

With respect, W. H. SIKES.

ENTERPRISE ITEMS.

The new stone mill is all ready for roofing.

Robinson & Little are now open for business, though they have not got everything arranged yet. They have one of the nicest, cleanest stores we ever saw.

Under the new leader the cornet band is making rapid progress. They are all old players, and all they needed was an instructor to polish them up a little.

Last week Samuel Lemmon, living near Rocky Ford, buried three of his children from that fatal disease, diphtheria. Three members of a happy family cut down in one week!

The M., A. & B. R. R. survey was commenced Monday morning at the north line of Manhattan township. The line was surveyed along the Blue River, crossing the Kansas a few rods above the mouth of the Blue. The toot of the iron horse will be heard in that direction before many months.

SPECIAL ADVANTAGES.

We enumerate a few of the special advantages which the Agricultural College presents to the young people of the State of Kansas:

First: Although an industrial school, as thorough and as complete an education—using the term in its popular sense—can be acquired here as in other schools. A student will make as rapid advancement here as elsewhere in the studies pursued, whether he remains here one or two years, or through the whole course.

Second: While obtaining a knowledge of English, mathematics, and the natural sciences, every student is learning some useful trade or art. This peculiar feature of the Agricultural College is a success. It should no longer be regarded as an experiment. Those who have been here one, two or three years are now in good positions, receiving good wages as telegraph operators, printers, carpenters, etc. Young men who have been through the course in practical agriculture and horticulture are rapidly becoming known as the best farmers in the localities in which they reside.

Third: The expenses are brought down to the lowest possible point. There are no matriculation fees, no tuition bills, no college customs, which compel a useless expenditure for badges or dress. The expenses are simply the cost of living, and the text-books used.

Fourth: The high moral and religious influence which exists at Manhattan. The students of the Agricultural College are young men and women of excellent character. Their average age is about eighteen years. They are deeply in earnest in their efforts for advancement. Of course there are a few exceptions, but the vicious or shiftless are soon thrown out. "Attend to business or leave" is the one rule. A wholesome religious influence pervades the Institution. The students' weekly prayer-meeting has been well sustained for more than ten years.

District boards about to issue school bonds are invited to correspond with us before negotiating elsewhere. We pay par for first-class 7 per cent bonds, issued upon our blanks. Bonds drawn on our blanks are not transferable, and hence may be safely sent by mail at letter postage. Blanks furnished free by M. L. Ward, Loan Commissioner.

DIRECTIONS TO APPLICANTS.

TERMS OF ADMISSION.

Candidates for admission must be fourteen years of age, and pass a satisfactory examination in reading; arithmetic, through decimal fractions; and English grammar, to syntax. Classes are started at the beginning of each year in Drill in Arithmetic and Drill in English; and the pupil must have the knowledge above indicated, else he will be unable to retain position if admitted.

Pupils will be received at any time during the year, if able to pass an additional examination upon the subjects studied by the classes which they expect to enter. But they will find it greatly to their advantage to be present at the opening of each term, or as soon thereafter as possible.

GRADES.

Both the Literary and Industrial recitations are graded daily upon a scale of 100; and an examination of all classes is made at the close of each month. A student not attaining an average grade of sixty is promptly dropped to a lower class, or excluded from the Institution until able to do so. The work of grading is strict and uniform in all the departments, and this process is rigorously used for sifting out incompetent and indolent pupils; thus more than accomplishing all that is designed to be effected by a "high standard of admission." Hence, the student's continuance in the College wholly depends upon his own action.

The course is based upon the determination to make the labor required in the preparation of one industrial and three literary recitations as much as the average student can perfectly perform, in ten hours a day. We design to give the pupil the worth of the time expended at College; and, in order thereto, he must do a full day's work with brain or hand. Only those students who can maintain a standing of ninety in each study will be allowed to take more than the prescribed number of recitations; and no one will be permitted to have less than one industrial and three literary recitations.

RELIGIOUS.

Unless otherwise directed by parents, students are required to attend chapel at 8:30 A. M. on academic days, and divine service once every Sabbath.

EXPENSES.

There are no charges whatever for enrollment, attendance or instruction in the regular courses; nor are there any "contingent fees" for the repair of buildings, for the use of books or apparatus, for diplomas, or the kindred privileges usually grouped under the term "contingent." Male students are furnished instruction, the use of apparatus, instruments or tools, in both the literary and industrial classes marked out for them, without any charge. And the same is true of female students in the regular classes provided for them. Printing and Telegraphy are industrials primarily provided for the education of female students, and male students taking either of these are charged $1 per month for use of instruments.

Instrumental music is a fine art or "accomplishment," rather than a mechanical art. We do not place it among our "industrials" in the same sense, or for the same purpose, that we do those provided for teaching the trades. Accordingly, the following fee is required from female students for tuition and the use of instruments:

Terms per week:

Private lessons, 2 a week, on any instrument,	$1.00
Private lessons, 1 a week, on any instrument,	.60
Class lessons, 2 a week, on any instrument,	.65

Instruction in harmony, etc., etc., from ten to fifty cents per week, as the student may or may not be in other classes.

The only charge made for material in either the literary or industrial departments is for the chemicals used by students in laboratory practice, which are furnished at wholesale prices, and amount to but a small sum.

Furnishing an absolutely free education is as much as can be reasonably asked; and the Institution neither boards, clothes, nor supplies the student with text-books. Boarding can be obtained in private families at from $2.75 to $4 per week. Washing costs from seventy-five cents to one dollar per dozen. Text-books, which can be procured in Manhattan, cost from $2 to $5 per term.

No student need expend over $5 per week; and many of our best pupils are living at $1.25 per week. Students desiring to "board themselves" can do so at from $1 to $2 per week. In a club of four young men, renting a house, the average cost to each for the term was $1:11 per week.

LABOR.

Manual labor by the students may be for either of two purposes: First, to acquire skill in a given art; second, to earn money. In the first case, the labor is educational; in the second, it should be paid for by the party benefited.

Educational Labor.—Manual labor in the recitations of the Industrial Departments, like mental labor in those of the Literary Departments, is purely educational and will not be remunerated. While the interest of the student will be held paramount in the direction of this labor, the practice necessary to dexterity will be required.

Remunerated Labor.—When the Institution needs labor on the Farm or elsewhere which is not educational, but simply for its own profit, and which a student is able and willing to perform, it becomes an employer instead of a teacher, and he an employe instead of a scholar. It pays for work, he works for pay. The relation between them is commercial, not educational; and both parties must act upon business principles. Hence, the College furnishes only such employment as its own interests require, and will pay according to the value of the service rendered at from seven to ten cents an hour.

AMOUNT EARNED.

It is impossible to predict how much a given person can earn, since that depends upon what he can do and what work there is to be done. Hence, it is wholly impossible for us to answer the question so often asked: "Do you think I can meet my expenses by work?" Some students make one-half their expenses, some the whole, and exceptional men have made more than expenses. As a rule, a faithful boy skilled in farm work can earn half his expenses on the Farm or in the Nursery. During the year he can ordinarily acquire sufficient skill in the wood or iron shops to enable him to make articles for sale. The whole question is one for his own consideration and decision. We can teach all who come, but cannot absolutely *promise* anything more. Hitherto we have refrained from holding out strong inducements respecting the amount of labor we might have to offer; but in view of the fact that during each of the last three years we have had more to do than the students could perform, we are inclined to give greater and positive encouragement on this point. Any boy who is in dead earnest, who is familiar with farm operations, and who can raise $50 to start with, should be able to carry himself through the four years' course. And certainly this places an education within the reach of every determined boy. As yet we are unable to offer similar advantages to girls, not requiring labor in the College departments which they can perform.

RULES.

1. Behave as a true man or woman should, at all times and in all places.

2. Attend to your own business promptly, thoroughly and courteously; and vigorously let alone that of other people.

3. Penalty: "Leave!"

PUBLICATIONS.

The "Hand-Book," published in 1874, containing a full discussion of the educational question and the aims of the Institution, will be forwarded to any one desiring it.

THE INDUSTRIALIST, a weekly journal edited by the Faculty and published by the Printing Department, contains original and seasonable articles on the Farm, Orchard, Trades, Sciences, and Education. Price, 75 cents a year. Address A. A. Stewart, Manhattan.

CALENDAR.

Fall Term, 1879.—Began Wednesday, September 10th, 1879, and will close December 18th, 1879.

TO NEW STUDENTS.

Bring the text-books you have been using. On arrival, first arrange for your boarding. A. A. Stewart will furnish information, either by letter or on application, concerning boarding places or rooms for rent. Report to the President at 8:30 A. M., immediately after chapel exercises, for enrollment.

For further information apply to Jno. A. Anderson, President, Manhattan, Kansas.

RAILROAD TIME-TABLE.

KANSAS PACIFIC RAILWAY.

PASSENGER ARRIVES.

No. 2, going East	11:58 A. M.
No. 4, going East	3:28 A. M.
No. 1, going West	4:03 P. M.
No. 3, going West	4:51 A. M.
No. 7 (freight), going West	8:45 A. M.

Nos. 1, 2 and 7 run daily. No. 3 runs daily except Monday. No. 4 runs daily except Sunday. Passengers with tickets are carried on No. 7.

GEO. C. WILDER, Agent.

THE INDUSTRIALIST.

SATURDAY, SEPTEMBER 13, 1879.

Industrial Education.

The real value of an education to the student depends upon two things: First, the practical worth of the knowledge taught; and, second, the degree in which he makes it his own. Hence, the ability of any institution to give a practical education depends upon the kind and aim of the knowledge it teaches, and upon the thoroughness of the instruction therein. The State Agricultural College was directly endowed by Congress, and is guided by the State, for the specific purpose of furnishing to the industrial classes of Kansas a "practical" education, that is, "one fit for use." As its name indicates, and as the statistics of the industries of the State require, its chief work must be that of giving a useful and usable education to those who will engage in farming; and, therefore, the Farmer's Course must, from the nature of the case, be its main one.

FARMER'S EDUCATION.

Words and figures are merely instruments with which to record ideas. They are not themselves ideas, nor should they be made the chief end of an education. As a wagon is necessary to haul grain, so are they a necessary part of an education; but as the wagon is not the grain, so they are not the knowledge which the farmer converts into money. Hence, the classics and higher mathematics are not taught. But it will be noticed in the following course that so soon as the pupil acquires working skill in the use of the English language as a tool, and of figures and lines as mathematical tools, those arts and sciences which present knowledge that has a cash value to the farmer are taught as rapidly as their importance and thorough acquisition will permit. Studies numbered (1) and (4) in the second, third and fourth years are the spine of the course, to which the others are as ribs and muscle.

FARMER'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Practical Agriculture (advanced.)		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	
3. Polit. Economy, Practical Law.		3. Practical Geometry.		3. Algebra.		3. Industrial Drawing.	
4. Zoology.		4. Horticul., Landscape Gardening.		4. Practical Agricul. (elementary).		4. English Structure.	
5. Agricul. Chemistry Meteorology.		5. Organic, Analytical Chemistry.		5. Physics.		5. Adv'd Arithmetic, Book-keeping.	
6. Logic.		6. Practical Surveying.		6. Industrial Drawing.		6. U.S. History, Industrial Drawing.	

WOMAN'S EDUCATION.

Nearly one-half of our students are females, and the Woman's Course is prepared expressly for their liberal and practical education. We have no doubt whatever that practical men and women, who understand what it means and what it seeks to do, will fully endorse it.

WOMAN'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Farm Economy, Special Hygiene.		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	
3. Polit'l Economy, Practical Law.		3. Industrial Drawing.		3. Algebra.		3. Industrial Drawing.	
4. Zoology.		4. Horticul., Landscape Gardening.		4. English Literature.		4. English Structure.	
5. Phys'c'l Geography, Meteorology.		5. Organic, Household Chemistry.		5. Physics.		5. Adv'd Arith., Book-keeping.	
6. Logic.		6. Household Economy.		6. Industrial Drawing.		6. U.S. History, Industrial Drawing.	

MECHANIC'S EDUCATION.

Because of the adaptedness of the leading course to the wants of the intelligent mechanic, it has been found practically unnecessary to diverge from the Farmer's Course. Additional studies, specially adapted to the mechanic's use, will be furnished in a Post-Graduate's Course.

If it be urged that the distinctively agricultural knowledge taught in the Farmer's Course is not directly valuable to the mechanic, we reply that, admitting the point for the purpose of argument, yet: 1. This knowledge is of more practical value to the mechanic than is the Latin, Greek, or a half dozen other things embraced in the usual course preparatory to the professions; 2. That the great majority of Kansas mechanics will also be more or less engaged in agriculture; 3. That those studies in the course which are directly valuable to the mechanic, together with the shop facilities, offer a better mechanic's education than can be elsewhere found west of the Alleghanies.

INDUSTRIAL DEPARTMENTS.

Having knowledge in the head is one thing; ability to use it with the tongue, fingers or feet is quite another thing. Both are vital to success in practical life. A man might thoroughly understand the theoretical principles of carpentry, and yet, not having used the tools, be wholly unable to earn carpenter's wages. So in all other vocations. Accordingly, instruction is given in the following well-equipped Industrial Departments, and every student is required to recite in some one of them, as selected by the pupil or parent:

FOR MALE STUDENTS.	FOR FEMALE STUDENTS.
The Farm.	Dress-making.
The Nursery.	Printing.
Carpentry.	Telegraphy.
Cabinet-making.	Scroll-sawing.
Turning.	Carving.
Wagon-making.	Engraving.
Painting.	Photography.
Blacksmithing.	Instrumental Music.

Each of these departments is conducted exactly as in daily life, and aims to give precisely the drill received by an apprentice. No charge is made, either for tuition or material, from male students taking the Industrials provided for them; nor from female students taking the ones provided for them, except in Instrumental Music. Male students taking either Printing or Telegraphy are charged $1.00 per month for the use of instruments and material.

DEPARTMENTS OF INSTRUCTION.

DEPARTMENT OF AGRICULTURE.

PRACTICAL AGRICULTURE.

Second Year:—General principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage.

Fourth Year: General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of a rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farmhouses; barns.

FARM ECONOMY.

Woman's Course, Fourth Year: Dairy products as human food; influences affecting character of milk; manufacture of condensed milk; the factory system and household plan of cheese-making; treatment of rennet; general process of cheese manufacture; subsequent treatment of cheese; butter-making; creameries; "deep" and "shallow" setting systems; general process of butter-making; packing and preserving butter.

DEPARTMENT OF BOTANY AND PRACTICAL HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest; also a course of lectures on Landscape Gardening. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard; fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture; shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in in the work of laying out and plotting grounds topographically.

CHEMICAL DEPARTMENT.

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life. Text-book, Ganot.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blowpipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

Are constantly in progress in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

DRILL IN ENGLISH.

"As grammar was made after language, so ought it to be taught after language."—*Herbert Spencer.*

Drill in English embraces the following topics:

Sounds of the language; drill in producing the vocal, sub-vocal and aspirate elements with accuracy, distinctness and volume; vowels, consonants.

Letters: Form; power; rules for spelling, drill.

Words: Signification, properties, modifications, variations, relation and dependence.

Sentences: Drill in statement of ideas; description, clearness, terseness, vigor; business letters, discussion; capitalization; syllabication; punctuation; construction and analysis of sentences; elements, uses and names; criticism of compositions printed as written; proof reading; grammatical construction; superfluous words and clauses; drill in reading, speaking and penmanship.

Text-books: Webster's Academic Dictionary; Lee & Hadley's Advanced Lessons in Language.

Pupils deficient in spelling, etc., should enter the printing class, the printing-office being the work-shop of language.

STRUCTURE OF ENGLISH.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

MATHEMATICAL DEPARTMENT.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

DRILL IN ARITHMETIC.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Following this line, the student, so far from hammering away at "pure" science draws from the mathematical store-house what he needs, and sees why he needs it. Accuracy of calculation and posting, rather than a *mere* comprehension of the principles, is aimed at. Besides the recitation-room drill in business forms, practice in the field is also given. Estimating the number of cords in a pile of wood said to be 100x4x4 feet is one thing; measuring a pile of wood through which any number of cats may be harmlessly thrown, and in which four-feet sticks are the exception, is quite another and more difficult thing.

ARITHMETIC AND BOOK-KEEPING

Is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides ensuring arithmetical practice, develops practical skill in that important art.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admiral system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study. In addition, constant practice in the application of lines to metal and wood is furnished in the Blacksmith, Carpenter, Turning, Scroll-sawing, Carving, Engraving and Printing shops, and to fabrics in the Sewing Department.

PRACTICAL GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the use of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

PRACTICAL SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

STUDIES SPECIAL TO WOMAN.

Besides the studies already indicated, attention is called to the following:

SPECIAL HYGIENE.

As shown in the course, one term is devoted to the study of Physiology, from the text-book of Dr. J. C. Dalton. This is followed in the fourth year by a course of lectures to young ladies by Mrs. Cripps on the subject of Hygiene, embracing such instruction in hygienic matters as are valuable to woman.

FARM ECONOMY considers those affairs of the farm which usually come under the supervision of the farmer's wife or daughter, and which are not included in "gardening" or "household economy;" such as butter and cheese-making, dairy management, etc. A course of lectures is delivered by the Professor of Practical Agriculture. See heading, "Farm Economy."

GARDENING is included in Practical Horticulture. See heading, "Landscape Gardening."

HOUSEHOLD CHEMISTRY. See heading, "Household Chemistry."

HOUSEHOLD ECONOMY

Follows Household Chemistry and consists of lectures by Mrs. Cripps on the art of house-keeping, embracing cookery, domestic management, and kindred topics. Many elderly gentlemen sufficiently know, and more young gentlemen will duly discover, that systematic knowledge of how cooking ought to be done is luminously different from the ability to do it. Instruction without practice can effect but little. Accordingly, a kitchen laboratory has been completely furnished, and affords every facility for drill in the art of cooking. This drill chiefly differs from that of a kitchen in the respect that after a girl has learned to wash dishes or pare potatoes she is not kept everlastingly at either. After full trial, we have found it just as feasible to give this practice, with profit and pleasure to the pupil, as it is to give laboratory practice in chemistry,—and no more expensive.

Printing!—Daily instruction and drill in the work of a First-Class Printer. The Literary Departments offer a thorough education in the construction and use of the English Language, as employed by the Proof-Reader; in Book-Keeping; and in Industrial Drawing, as the best developer of that taste necessarily exercised by every good Job Printer. The Printing Department is well furnished with all the facilities for a speedy mastery of the art of Printing, and is in charge of a practical printer. Besides regular class instruction in printing, the weekly publication of the INDUSTRIALIST by the Department furnishes advanced students the requisite drill in newspaper work.

THE INDUSTRIALIST

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THE INDUSTRIALIST.

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The History of Petroleum.

A correspondent of the *Philadelphia Times*, writing from Oil City, Pa., thus briefly sketches the history of the universally-used petroleum: "In 1844 petroleum was used as a medicine. At that time, and up to 1853 it was known as 'Seneca Oil,' probably on account of its having been found on the surface of Seneca Lake, and having first been used by the Seneca Indians as a medicine. The mode of obtaining this oil, at that period of its history, was by throwing blankets on the surface of still water where the oil was wont to accumulate, and after they had become saturated to remove them and extract the oil by wringing the blankets. From this primitive beginning has grown one of the leading industries in this State. It was not, however, until the years of 1853-4 petroleum began to be valued as an illuminator, and this only in a limited way, for it was then burned in its crude state in old lard-oil lamps, which were liable to explode at any time.

"Between 1854 and 1857 it became known that the explosive qualities of this product could be removed by subjecting it to a process of distillation, and from that time its value began to be recognized. Here a difficulty arose. The oil could not be gathered in sufficient quantities to supply the demand, and something must be done or the new industry would fall through. Accordingly, in the year 1858 a joint stock company was organized for the purpose of boring into the rock in quest of the now valuable oil; and Col. E. N. Drake was put at the head of this company, with full power to push the enterprise. The work proved to be full of difficulties. The facilities for probing the rock at that time were exceedingly limited. The derricks used were only thirty feet high, and the drilling tools only weighed in the neighborhood of two hundred and fifty pounds, and the old 'horse-power' was used for running the machinery. With all these difficulties to contend with the work progressed slowly, and it was not until August 28, 1859, that the drill struck the shale rock, at a depth of seventy-one feet, and the well immediately filled up to within five inches of the surface. A small pump was inserted, and the production was found to be about forty barrels per diem, at which rate it kept up for several months. This well was located in Cherry Tree township, Venango county, about two miles from what is now the city of Titusville, on the banks of Oil Creek. Other wells soon followed, and people began to flock to this new field of excitement, ready to tap the veins from which the liquid wealth poured in such profusion."

The Old-Fashioned Girl.

She flourished thirty or forty years ago. She was a little girl until she was fifteen. She used to help her mother wash the dishes and keep the kitchen tidy, and she had an ambition to make pies so nicely that papa could not tell the difference between them and mama's; and yet she could fry griddle-cakes at ten years of age, and darn her own stockings before she was twelve, to say nothing of knitting them herself.

She had her hours of play, and enjoyed herself to the fullest extent. She had no very costly toys, to be sure, but her rag doll and little bureau and chair, that Uncle Tom made, were just as valuable to her as the $20 wax doll and elegant doll furniture the children have nowadays.

She never said "I can't," and "I don't want to," to her mother, when asked to leave her play and run upstairs or down on an errand, because she had not been brought up in that way. Obedience was a cardinal virtue in the old-fashioned little girl.

She rose in the morning when she was called, and went into the garden and saw the dew on the grass, and if she lived in the country, she fed the chickens and hunted up the eggs for breakfast.

We do not suppose she had her hair in curl-papers, or crimping-pins, or had it "banged" over her forehead, and her flounces were no trouble to her. She learned to sew by making patch-work, and we dare say she could do an "over-and-over" seam as well as nine-tenths of the grown-up women do nowadays.

The old-fashioned little girl did not grow into a young lady and talk about beaux before she was in her teens, and she did not read dime novels, and was not fancying a hero in every plowboy she met.

She learned the solid accomplishments as she grew up. She was taught the arts of cooking and housekeeping. When she got a husband she knew how to cook him a dinner.

She was not learned in French verbs or Latin declensions, and her near neighbors were spared the agony of hearing her pound out "The Maiden's Prayer" and "Silver Threads Among the Gold" twenty times a day on the piano; but we have no doubt she made her family quite as comfortable as the modern lady does hers.

It may be a vulgar assertion, and we suppose that we are not exactly up with the times, but we honestly believe, and our opinion is based on considerable experience and no small opportunity for observation, that when it comes to keeping a family happy, a good cook and housekeeper is to be preferred above an accomplished scholar. When both sets of qualities are found together, as they sometimes are, then is the household over which such a woman has control blessed.

The old-fashioned little girl was modest in her demeanor, and she never talked slang or used by-words. She did not laugh at old people or make fun of cripples, as we saw some modern little girls doing the other day. She had respect for elders, and was not above listening to words of counsel from those older than herself.

She did not think she knew as much as her mother, and that her judgment was as good as her grandmother's.

She did not go to parties by the time she was ten, and stay till after midnight playing euchre and dancing with any chance young man who happened to be present.

She went to bed in season, and doubtless said her prayers before she went, and slept the sleep of innocence, and rose up in the morning happy and capable of giving happiness.

And if there be an old-fashioned little girl in the world to-day, may heaven bless her and keep her, and raise up others like her. —*Exchange.*

MUCH has been said and written in regard to an improved culture of the rural classes. They are demanding something more than hitherto, and asserting for themselves a higher position in the social scale. While there are steps backward as well as forward in all movements toward a higher civilization, we may be assured that the end here sought will be reached. Agriculture in all its departments must, in years to come, command a higher class of talent and a broader culture than in the past. While we are inclined to give honors to the rural press, to the associations and societies formed to promote rural interests, and to agricultural colleges, where they at all recognize the object of their creation, the more intelligent among the masses are feeling that they can justly demand something more for the children in the common schools than has hitherto been offered them. We ask that the culture of the common school shall be turned in some slight degree towards rural and agricultural interests. A more general diffusion of knowledge relating to agriculture and industrial pursuits is demanded. Our children need culture that shall impel towards farm life. This cannot be attained by the instrumentalities now employed.

Hence we propose that the common school shall be made more tributary to rural interests. We want an elementary course of instruction in matters, both practical and scientific, that relate directly to rural life. This should be so elementary in its character that the great mass of our childrren may acquire it by the time they are fourteen years old. By this means the common school will, to a certain extent, become the training school of our agricultural and industrial colleges. These latter institutions will then have opened to them a much wider field of usefulness, and the possibility of a much more thorough culture to those who may enjoy their advantages.—*Prof. Gale, Rural New-Yorker.*

Thorough Cooking.

It is one of the common mistakes in cooking to give too little time to the cooking of meat and vegetables. The cook is careless about getting them over the fire in season, and to make up for the delay she attempts to "rush things," by using a very hot fire, spoiling the food by too furious boiling or baking. Hard boiling toughens the fibers of meat, and spoils the texture of vegetables, but a long, steady boiling heat gradually softens or makes tender the toughest fibers. Many persons suppose that certain articles of food do not agree with them, when the whole difficulty arises from the imperfect manner in which they are prepared. Some vegetables are thought to be especially provocative of flatulence, but a more thorough cooking usually remedies that evil. Flatulence has other causes, as over-eating, or too great a proportion of sugar in the diet, but those articles of food which are usually associated with the evil may be robbed of those terrors by a more prolonged cooking. Cook dry beans several hours, a gentle but steady simmering — five hours are not too many, even after soaking all night. Dry peas need the same treatment. Vegetables need more and more time as they grow older. By spring rutabagas need cooking half a day, and onions should be boiled an hour or more. Salsify and parsnips, especially the former, need more than the twenty minutes' boiling usually prescribed for them.—*Ex.*

AN exchange gives the following sensible advice: Don't believe every senseless rumor you hear respecting reputable citizens; don't retail a calumny against any man unless you have good foundation for believing it true; don't bite off your own nose to spite your face; don't let passion knock down judgment and choke its life out; don't go back on principle to gratify personal feeling; don't betray the confidence of your friends; don't give your friend the "dirty shake," as the boys say, because he don't see through your spectacles; don't harbor animosity against a neighbor because his opinions conflict with yours. Be Christlike; be charitable.

WE know a girl who will wrestle with a croquet mallet in the hot sun for hours and not complain. But just ask her to hold on to the wooden end of a broom for a few minutes and she'll have a fit.

THERE is something passing strange about human nature. If a man had to support his family by playing billiards at two dollars a day, he'd swear he had to work awful hard for a living.—*Middletown Transcript.*

THE INDUSTRIALIST.

SATURDAY, SEPTEMBER 20, 1879.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

Oats with Wheat.

The experiment has been made of sowing oats and wheat together with a view to obtain a winter covering for the wheat. The seed, in proportion of one part of oats to two parts of wheat, was sown in the fall, and the oats sprang up quickly and were killed by the early frost, the stocks and leaves lying on the ground all winter, keeping the snow from blowing away and preventing the snow from thawing the frozen ground. In the spring the dead oats made a good top-dressing for the growing wheat. The crop of wheat in the following reason was reported to be excellent, while wheat on the adjoining land, planted in the usual manner, was of no value.—*Exchange.*

The substance of the above item is being copied quite extensively by the western papers, and it is more than probable that it will do Kansas farmers a good deal of damage. This paragraph had its origin in one of the Iowa agricultural papers; and in the State of Iowa, the practice of sowing oats with winter wheat, we are told, is quite generally and successfully followed. But in our own State we know that the effort to grow winter wheat by protecting its early growth with a crop of oats will result disastrously in the vast majority of cases. We have tried this "experiment" at least twice upon the College farm, and several times in the State of Michigan, and always with the same result; namely, a diminished yield—often amounting to a loss of one-half—upon that part of the field in which the oats grew.

Only a year ago we seeded to winter wheat a field one-half of which, during the previous season, had grown a crop of oats. Upon this half of the field, the oats came up quite early with the wheat, and for a time it was difficult to see which half of the field had the advantage in the race. But as soon as the frosts had destroyed the oats, the difference became quite apparent; and so great was the difference that we have frequently heard people, in passing the field, remark that the half of the field upon which the oats grew would not give half a crop as compared with the remainder. In harvesting, the difference was well marked; and there seemed, and without doubt was, a difference of one-third in favor of that part of the field which had not received the unfortunate "protection" of the oats.

The common sense of the question is this: The young oats, by crowding the wheat and robbing it of its proper nutriment at a critical period, act as weeds, and indeed are weeds. The notion that the dead oats can act as mulch or "winter covering" for the wheat, in any degree worth mentioning, we know to be purely a myth.—*Prof. Shelton.*

The Berkshires Again.

Prof. Shelton:—You will greatly oblige many farmers if you will give, in the INDUSTRIALIST, your idea of and success with English Berkshire hogs. CÆSAR.

The above is handed to me by a student from Cowley county, at the request of neighbors, and we take pleasure in answering it, although the ground has been covered in previous numbers of this paper.

The general farmer cannot afford to keep any kind of farm stock because pre-eminently adapted to some one purpose, or because it possesses, in a high degree, some one valuable quality, which, of course, has been developed at the expense of other valuable qualities. It is because the Berkshire is a very symmetrically-developed animal, having many useful qualities moderately and often very strongly developed, that we have taken occasion in this paper to advise his cultivation by the general farmer. In some single quality, many breeds will surpass the Berkshire: the Essex we are satisfied will mature earlier, and will make a pound of pork for less outlay of feed; the Poland-China uniformly has better hams and comes to a greater weight; and the "native," in the number of young produced at a litter, will surpass either. But when we consider all of the numerous valuable qualities of the Berkshire, the superior quality of its flesh, its great hardihood and ability to resist diseases, the ease with which it fattens at an early age, and its fertility, we have no hesitation in giving our preference to the Berkshire, so far as general farm purposes are concerned.

A great injury has been done the Berkshire breed, of late years, by breeders who have endeavored to increase the size of the race by breeding only from the largest and coarsest specimens. In this way, a nervous, long-legged, flat-sided, and weak-loined animal has been produced, and one that has little to recommend it except size, which is a poor enough recommendation for this breed. The best Berkshires that we have ever seen have been the medium or undersized ones.

The advantages or strong points of the Berkshire breed are these: The meat is the best, and it commands the highest price; the sows are very prolific, and make the best and most attentive mothers. The Berkshires, as a rule, although there are many exceptions to it, are heavily developed at the fore-end; and you nearly always find with this breed a broad head, set closely on a deep, short and thick neck,—the neck blending well with the shoulder, and the muscles of the shoulder again pass smoothly into those of the ribs. The ribs are deep and well sprung, qualities which always accompany constitution and vitality. For these reasons, chiefly, we prefer the Berkshire to any other breed for general farm purposes; and the only breed which has ever tempted us seriously to change our mind in this matter is the little all-black Essex.—*Prof. Shelton.*

Notes on Colorado. No. II.

The mines of Colorado, although they have yielded an immense amount of the precious metals, have directly added but little to the permanent wealth of the State. They are owned principally by Eastern capitalists, and the net yield is removed from the State. Since farming and stock-raising are on a comparatively small scale, Colorado is not destined to be noted as a rich State.

Mining here, as elsewhere, is very precarious. One or two rich strikes will ensure a rush of prospectors and miners. With these come eating-houses and saloons as the first essential; and soon, grocery and dry goods stores. In one or two months a desolate spot may be transformed into a thriving if not a picturesque village. Were the merchants in the mining towns to go East for their supplies, they might find on their return that a later and richer "find" had depopulated their once thriving city, and they were without customers. But by making light purchases in home cities, this risk is avoided. Denver, Boulder, and other cities at the foot of the mountains, owe their prosperity to this fact.

In many mines the character of the ore is such that it cannot be reduced without great expense, requiring quartz mills; and frequently a large per cent of the gold is lost. An ore that will assay reasonably well may not pay the expenses of mining and reduction; but not so with the silver ore of Leadville.

In speaking of the mines of Colorado, Leadville should not be neglected; but so much has been said by numerous tourists that one can scarcely say anything new. The choice of a route to Leadville depends, to some extent, upon the object of the traveler. If business calls him, he will be likely to take the Denver & South Park Railroad to Como, and thence by stage to Leadville, through the Weston Pass; or, if greatly excited, he will brave the frightful precipices, and make the trip over the Mosquito Pass in five hours. If pleasure has called him to the city of the clouds, he may go to Golden, Idaho Springs and Georgetown, and cross the Range through Snake River Pass, reaching Leadville after a hard day's ride over rough roads. Perhaps the most pleasant route is by the way of Colorado Springs, stopping off to visit Manitou, the Garden of the Gods, Glen Eyrie, etc.; thence to Pueblo and Canon City. Two days' staging from this place up the canyon brings him to the objective point. A spur of the snowy Range must be crossed by either route.

As a business location, Leadville has been a very desirable point. It is a fast place. Crime, as might be expected, is frequent. Everything is run upon the high-pressure principle. The most remunerative mines are adjacent to the city, but prospect holes may be seen on every side. While a number of mines have rapidly enriched the proprietors, a large proportion of the mines have as yet given no returns whatever. It is much of a lottery, and he who invests must feel that he can afford to draw a blank.

The ore is an argentiferous carbonate of lead. It is found in crevices and in beds. The "soft carbonate" has much the appearance of a bright yellow clay. The "hard carbonate" is dark brown in color and nearly as hard as limestone. The ore is easily smelted, and a large number of smelters are now in operation. Blast furnaces are in general use. The usual charge of ore, lime and coke is added at the top; the slag and metal are drawn off below.

It will be a long time before some of the richer mines are exhausted; but, unless ore is found over a greater extent of territory, the camp cannot retain the prestige it now enjoys.—*Prof. Failyer.*

Students Enrolled Since Sept. 10, 1879.

NAME.	COUNTY.
Abbey, Frank L.	Dickinson.
Adams, Emma L.	Riley.
Aley, Frank A.	Chautauqua.
Allen, Albert H.	Nemaha.
Allen, Clara M.	Nemaha.
Allingham, Jessie	Riley.
Anderson, John	Butler.
Ayres, Sarah	Shawnee.
Bacheller, Viola I.	Rush.
Barnett, Robert F.	Sedgwick.
Bass, Alfred G.	Shawnee.
Bauer, George	Douglas.
Bayles, Rachel M.	Riley.
Beacham, Augustine	Marshall.
Bistline, Florence S.	Shawnee.
Boles, Washington	Cherokee.
Bolton, William	Wabaunsee.
Browning, Alice	Riley.
Buchli, Bartholomew	Wabaunsee.
Buell, Delight A.	Riley.
Call, Lewis W.	Shawnee.
Calvin, J. H.	Riley.
Campbell, Bennie	Riley.
Cassteel, Charles	Miami.
Chenoweth, J. W.	Cherokee.
Clardy, Albert	Pottawatomie.
Clark, Charles	Anderson.
Clarke, Mary	Riley.
Coleman, Edward P.	Iowa.
Cook, Rosa	Nemaha.
Copley, Albert	Jefferson.
Corey, William	Shawnee.
Couse, Eva	Johnson.
Cox, Lizzie R.	Riley.
Cranford, Ida	Saline.
De Tar, John A.	Johnson.
Donaldson, Flora	Butler.
Donaldson, George	Butler.
Dow, George H.	Riley.
Dunn, Frank W.	Anderson.
Durkee, Orpheus	Greenwood.
Eells, Allan B.	Riley.
Emert, Timothy H.	Pottawatomie.
Everett, John P.	Miami.
Favour, William P.	Greenwood.
Ferguson, Woods S.	Miami.
Fisher, Julia Y.	Missouri.
Fisk, William W.	Cowley.
Fowler, George W.	Jefferson.
Gallagher, George B.	Morris.
Gardiner, I. D.	Shawnee.
Gardiner, Lydia P.	Shawnee.
Gault, Lincoln F.	Barton.
Gist, Joseph T.	Riley.
Glossop, Emma	Riley.
Griffing, Mary L.	Riley.
Griffing, William J.	Riley.
Gross, William	Saline.
Haines, Harvey	Riley.
Harris, Simeon H.	Johnson.
Harvey, Noah T.	Cherokee.
Himes, Hattie	Riley.
Hobbs, Loren E.	Massachusetts.
Hollenberg, Rudolph A.	Washington.
Hopkins, Harry H.	Butler.
Hopper, George E.	Mitchell.
Hosmer, Mina	Riley.
Hotchkiss, Charles S.	New York.
Hoyt, Emma	Riley.
Hunt, Henry L.	Cherokee.
Hunting, Cora M.	Riley.
Jeffery, Fletcher	Riley.
Jeffery, William J.	Riley.
Jewell, Fred	Butler.
Kern, Edwin	Jewell.
Keyes, George C.	Wabaunsee.
Kimble, Emma	Riley.
Kinsey, Dora	Shawnee.
Kinsey, Lorena	Shawnee.
Knaus, Warren	Wilson.
Knipe, George D.	Riley.
Knostman, Emma	Riley.
Lawrence, William	Cherokee.
Lay, Joseph G.	Jefferson.
Lewis, Gregg P.	Lyon.
Lewis, Issie	Riley.
Lightfoot, William J.	Jewell.
Limbocker, Clarence	Riley.
Limbocker, Clyde	Riley.
Linder, John	Montgomery.
Lockhart, Orval	Greenwood.
Long, John	Greenwood.
Lowe, Charles	Wabaunsee.
Lyon, Frank W.	Lyon.
Mahaffie, J. F.	Johnson.
Marlatt, Charles L.	Riley.
Marshall, Thomas F.	Johnson.
Mason, Dalinda	Ottawa.
McGuire, Katie I.	Johnson.
McMullen, Orman A.	Cherokee.
McNair, Alice E.	Riley.
McNair, S. E.	Riley.
Messenger, Charles	Cowley.
Miller, Eugene H.	Shawnee.
Moore, Charles W.	Massachusetts.
Moses, Willie A.	Dickinson.
Neiswender, Lincoln H.	Shawnee.
Noland, Manda	Riley.
Packenham, Charles A.	Cherokee.
Packenham, Chester H.	Cherokee.
Paddleford, Solon M.	Riley.
Paine, Edwin C.	Lyon.
Parker, Grace	Riley.
Pattison, Charles	Butler.
Peckham, Almira S.	Riley.
Platt, Henry A.	Riley.
Plummer, Dora	Pottawatomie.
Pomeroy, William G.	Osage.
Powers, Benjamin	Riley.
Pray, Cora A.	Pottawatomie.
Prescott, Frederic H.	Barton.
Quinby, May V.	Clay.
Randel, Alta	Nemaha.
Reeve, Mark A.	Lyon.
Reynolds, Theodore	Davis.
Richards, Bettie	Pottawatomie.
Richardson, Noble A.	Wilson.
Robinson, Joseph N.	Shawnee.
Rose, George E.	Cherokee.
Rose, Wm. N.	Cherokee.
Schantz, Willis O.	Jackson.
Sexton, William L.	Sedgwick.
Shaffer, John E.	Missouri.
Sherman, Charles W.	Johnson.
Shore, Rosa B.	Morris.
Short, Burton L.	Cherokee.
Sickels, Maria E.	Missouri.
Sloan, J. A.	Clay.
Smith, B. B.	Dickinson.
Snow, Cora L.	Riley.
Stiles, Charles H.	Wabaunsee.
Strong, Grace R.	Riley.
Stuart, Jerome	Riley.
Thompson, George F.	Cowley.
Tunnicliff, Simeon	Montgomery.
Tyler, George K.	Morris.
Vaught, Cora	Butler.
Viles, Emily D.	Iowa.
Wall, Elbert	Ohio.
Walden, Sarah E.	McPherson.
Walker, James	Cowley.
Wallace, John E.	Davis.
Walters, Frank M.	Brown.
Ward, Milan T.	Illinois.
Whaley, Rowena	Riley.
Whaley, Willie E.	Riley.
White, Perry	Riley.
Whitney, Bertha	Riley.
Wilson, William	Nemaha.
Wingo, S. D.	Jackson.
Woodburn, William	Nemaha.
Woods, Albert O.	Sumner.
Worley, Francis T.	Greenwood.

THE INDUSTRIALIST.

SATURDAY, SEPTEMBER 20, 1879.

Instead of the usual circular or catalogue, we send the Industrialist to those desiring information about the Kansas State Agricultural College. We would call attention to the articles headed "Departments of Instruction," "Industrial Education," "Special Advantages," and "Directions to Applicants." If further information is desired, address Agricultural College, Manhattan, Kansas.

Regents Wood and Henry came down to Manhattan Friday to meet and consult with President Fairchild.

President Fairchild arrived yesterday evening. To-day he is looking over the farm and visiting the different departments.

Herbarium! is the watch-word of the members of the Botany class. Every one is required to make a collection of plants.

If students keep coming in, our present chapel will soon be too small to hold them. As it is now, we are considerably crowded.

The old building in front of the Laboratory is soon to be removed. This is in accordance with an action taken at the last meeting of the Board.

One hundred and sixty-three students have been enrolled this term. We republish the names this week, complete to date. Some new ones have come in to-day, but will not report until Monday.

A College orchestra, composed of students, has just been organized by Prof. Hofer. It contains ten members, who have gone to work as if they meant business. Look out for serenades before long.

The Topeka *Capital* says that J. E. Williamson, having been elected Principal of the Osage City schools, has resigned his position in the Harrison Street school, Topeka. Joe's many friends here will be glad to hear of his prosperity.

The Alpha Beta Society met Friday afternoon with a large number in attendance. The names of the Misses Hosmer and Pray were proposed. Those proposed last week were elected, and seven were initiated. The officers were installed, and the President delivered an earnest inaugural. After a somewhat lengthy debate, the judges decided that, for the best interest of the country, the Capitol should be located at St. Louis. The *Gleaner* was duly presented, and we think duly appreciated. The question for next meeting is, "*Resolved*, That the Department of Agriculture of this nation is not of practical advantage." Affirmative, Whaley and Platt; negative, Rose and Worley. The meetings of the Society are growing in interest, so that there will be no difficulty in entertaining visitors. B.

The Webster Society held its first meeting for the year last Saturday evening, in Telegraph Hall. Under the inspiring presence of some thirty new students, whom we proposed to astound, we proceeded to discharge our proverbial Websterian thunder. Extemporaneous speaking passed off lively, after which we proceeded to elect officers for the term. At the first ballot it seemed we all desired to be President; but, wisely remembering that "he who cannot paint must grind the colors," we quietly chose the following officers: President, N. A. Richardson; Vice-President, Lewis W. Call; Secretary, George Thompson; Treasurer, Mark A. Reeve; Librarian, C. E. Wood. Several minor offices were filled and a full corps of directors elected. A full programme next week. Come out and see us. Although we don't admit ladies, can't sing, and won't wear red tape, we promise you a pleasant time. WOOD.

JOHNSON COUNTY.

OLATHE, Kas., Sept. 14th, 1879.

Editors Industrialist: — The communications from different parts of the State have been very interesting to me, and I cheerfully respond to call. I have spent a very pleasant vacation, and would have been glad to return to College this fall, but did not know, until I had commenced teaching, that it would be possible for me to return, so I shall not get to resume my studies for another year.

I have the pleasure of seeing Mr. Hulett frequently. The last time I met him he was in Olathe procuring the paint necessary to put the "finishing stroke" on his new residence. He says he has had an excellent opportunity of putting in practice the knowledge gained in the Mechanical Department. Our friend Dickson attended the Normal and received a certificate, but I do not know whether he will teach or go to College.

Johnson county, which is admitted to be second to none as a fine agricultural district, is situated in that part of the State which has arrived at a sufficient age to begin to "fix up;" and having survived the "measles" and "whooping cough," it bids fair to be the garden spot of the great West. The many substantial and cosy farm residences are so many evidences of the prosperity of her farmers. Olathe, the county seat, situated on the line of the K. C., F. S. & G. R. R., twenty-five miles southwest of Kansas City, is a flourishing town of about twenty-five hundred inhabitants.

The State asylum for the deaf and dumb, situated here is in a prosperous condition. The buildings, though large and commodious, are inadequate to the wants of this class of students in the State, and a large wing will soon be completed. The corn crop in this vicinity is immense. The wheat and oats crops, though not so good, are by no means a failure. Flax-growing is becoming an important feature in this county. This crop seldom fails, and can be put on the market at a good price just at that season of the year when money is an evil that the average farmer is willing to bear with for a short time.

Several persons have told me they were going to the Agricultural College this fall, if possible. Hoping that Johnson county may be well represented there, and wishing success to all connected with the Institution, I am,

Respectfully, J. N. MORROW.

NATIONALIST ITEMS.

Raphel is putting in a pump for Charles Briggs, in front of his store.

The measles and scarlet fever are quite prevalent among the children.

A. J. Whitford is having a store-house built in the rear of his store. Larger stock, more room.

Mr. Tood has broken the land south of his house for a new nursery. It is in a most excellent situation.

D. C. Hulse expects to commence work, in a few days, on a frame dwelling, 16x26 feet and 1½ story high, for Dr. Ward.

Burgoyne is now fairly settled in his new quarters, and has fixed his gallery up in fine style,—the sitting-room being commodious and pleasant.

A wagon load of peaches sold quite readily, for $1.50 per bushel, on our streets Tuesday. Last year they could be bought for twenty-five or thirty cents.

P. W. Zeigler intends erecting a two-story stone building soon, for his own occupancy,—probably on what is known as the Marlatt lot. He expects to put in the foundations this fall.

We understand that a gentleman from Abilene is looking for a lot on which to build a residence, and that he intends to start a marble-yard about the first of October. Who says Manhattan is not booming?

Messrs. Noah Harvey, Charles and Chester Packenham, and William Lawrence, of Quaker Valley, and George Boles, of Baxter Springs, started to Manhattan last week, to attend the fall and winter terms of the Agricultural College. Mr. O. A. McMullen will leave this week for the same place. Except Riley county, in which the College is located, Cherokee furnishes more students at the College than any other county in the State.—*Empire City Echo.*

SPECIAL ADVANTAGES.

We enumerate a few of the special advantages which the Agricultural College presents to the young people of the State of Kansas:

First: Although an industrial school, as thorough and as complete an education—using the term in its popular sense—can be acquired here as in other schools. A student will make as rapid advancement here as elsewhere in the studies pursued, whether he remains here one or two years, or through the whole course.

Second: While obtaining a knowledge of English, mathematics, and the natural sciences, every student is learning some useful trade or art. This peculiar feature of the Agricultural College is a success. It should no longer be regarded as an experiment. Those who have been here one, two or three years are now in good positions, receiving good wages as telegraph operators, printers, carpenters, etc. Young men who have been through the course in practical agriculture and horticulture are rapidly becoming known as the best farmers in the localities in which they reside.

Third: The expenses are brought down to the lowest possible point. There are no matriculation fees, no tuition bills, no college customs, which compel a useless expenditure for badges or dress. The expenses are simply the cost of living, and the text-books used.

Fourth: The high moral and religious influence which exists at Manhattan. The students of the Agricultural College are young men and women of excellent character. Their average age is about eighteen years. They are deeply in earnest in their efforts for advancement. Of course there are a few exceptions, but the vicious or shiftless are soon thrown out. "Attend to business or leave" is the one rule. A wholesome religious influence pervades the Institution. The students' weekly prayer-meeting has been well sustained for more than ten years.

DIRECTIONS TO APPLICANTS.

TERMS OF ADMISSION.

Candidates for admission must be fourteen years of age, and pass a satisfactory examination in reading; arithmetic, through decimal fractions; and English grammar, to syntax. Classes are started at the beginning of each year in Drill in Arithmetic and Drill in English; and the pupil must have the knowledge above indicated, else he will be unable to retain position if admitted.

Pupils will be received at any time during the year, if able to pass an additional examination upon the subjects studied by the classes which they expect to enter. But they will find it greatly to their advantage to be present at the opening of each term, or as soon thereafter as posssble.

GRADES.

Both the Literary and Industrial recitations are graded daily upon a scale of 100; and an examination of all classes is made at the close of each month. A student not attaining an average grade of sixty is promptly dropped to a lower class, or excluded from the Institution until able to do so. The work of grading is strict and uniform in all the departments, and this process is rigorously used for sifting out incompetent and indolent pupils; thus more than accomplishing all that is designed to be effected by a "high standard of admission." Hence, the student's continuance in the College wholly depends upon his own action.

The course is based upon the determination to make the labor required in the preparation of one industrial and three literary recitations as much as the average student can perfectly perform, in ten hours a day. We design to give the pupil the worth of the time expended at College; and, in order thereto, he must do a full day's work with brain or hand. Only those students who can maintain a standing of ninety in each study will be allowed to take more than the prescribed number of recitations; and no one will be permitted to have less than one industrial and three literary recitations.

RELIGIOUS.

Unless otherwise directed by parents, students are required to attend chapel at 8:30 A. M. on academic days, and divine service once every Sabbath.

EXPENSES.

There are no charges whatever for enrollment, attendance or instruction in the regular courses; nor are there any "contingent fees" for the repair of buildings, for the use of books or apparatus, for diplomas, or the kindred privileges usually grouped under the term "contingent." Male students are furnished instruction, the use of apparatus, instruments or tools, in both the literary and industrial classes marked out for them, without any charge. And the same is true of female students in the regular classes provided for them. Printing and Telegraphy are industrials primarily provided for the education of female students, and male students taking either of these are charged $1 per month for use of instruments.

Instrumental music is a fine art or "accomplishment," rather than a mechanical art. We do not place it among our "industrials" in the same sense, or for the same purpose, that we do those provided for teaching the trades. Accordingly, the following fee is required from female students for tuition and the use of instruments:

Terms per week:

Private lessons, 2 a week, on any instrument, $1.00
Private lessons, 1 a week, on any instrument, .60
Class lessons, 2 a week, on any instrument, .65

Instruction in harmony, etc., etc., from ten to fifty cents per week, as the student may or may not be in other classes.

The only charge made for material in either the literary or industrial departments is for the chemicals used by students in laboratory practice, which are furnished at wholesale prices, and amount to but a small sum.

Furnishing an absolutely free education is as much as can be reasonably asked; and the Institution neither boards, clothes, nor supplies the student with text-books. Boarding can be obtained in private families at from $2.75 to $4 per week. Washing costs from seventy-five cents to one dollar per dozen. Text-books, which can be procured in Manhattan, cost from $2 to $5 per term.

No student need expend over $5 per week; and many of our best pupils are living at $1.25 per week. Students desiring to "board themselves" can do so at from $1 to $2 per week. In a club of four young men, renting a house, the average cost to each for the term was $1.11 per week.

LABOR.

Manual labor by the students may be for either of two purposes: First, to acquire skill in a given art; second, to earn money. In the first case, the labor is educational; in the second, it should be paid for by the party benefited.

Educational Labor.—Manual labor in the recitations of the Industrial Departments, like mental labor in those of the Literary Departments, is purely educational and will not be remunerated. While the interest of the student will be held paramount in the direction of this labor, the practice necessary to dexterity will be required.

Remunerated Labor.—When the Institution needs labor on the Farm or elsewhere which is not educational, but simply for its own profit, and which a student is able and willing to perform, it becomes an employer instead of a teacher, and he an employe instead of a scholar. It pays for work, he works for pay. The relation between them is commercial, not educational; and both parties must act upon business principles. Hence, the College furnishes only such employment as its own interests require, and will pay according to the value of the service rendered at from seven to ten cents an hour.

AMOUNT EARNED.

It is impossible to predict how much a given person can earn, since that depends upon what he can do and what work there is to be done. Hence, it is wholly impossible for us to answer the question so often asked: "Do you think I can meet my expenses by work?" Some students make one-half their expenses, some the whole, and exceptional men have made more than expenses. As a rule, a faithful boy skilled in farm work can earn half his expenses on the Farm or in the Nursery. During the year he can ordinarily acquire sufficient skill in the wood or iron shops to enable him to make articles for sale. The whole question is one for his own consideration and decision. We can teach all who come, but cannot absolutely *promise* anything more. Hitherto we have refrained from holding out strong inducements respecting the amount of labor we might have to offer; but in view of the fact that during each of the last three years we have had more to do than the students could perform, we are inclined to give greater and positive encouragement on this point. Any boy who is in dead earnest, who is familiar with farm operations, and who can raise $50 to start with, should be able to carry himself through the four years' course. And certainly this places an education within the reach of every determined boy. As yet we are unable to offer similar advantages to girls, not requiring labor in the College departments which they can perform.

RULES.

1. Behave as a true man or woman should, at all times and in all places.

2. Attend to your own business promptly, thoroughly and courteously; and vigorously let alone that of other people.

3. Penalty: "Leave!"

PUBLICATIONS.

The "Hand-Book," published in 1874, containing a full discussion of the educational question and the aims of the Institution, will be forwarded to any one desiring it.

THE INDUSTRIALIST, a weekly journal edited by the Faculty and published by the Printing Department, contains original and seasonable articles on the Farm, Orchard, Trades, Sciences, and Education. Price, 75 cents a year. Address A. A. Stewart, Manhattan.

CALENDAR.

Fall Term, 1879.—Began Wednesday, September 10th, 1879, and will close December 18th, 1879.

TO NEW STUDENTS.

Bring the text-books you have been using. On arrival, first arrange for your boarding. A. A. Stewart will furnish information, either by letter or on application, concerning boarding places or rooms for rent. Report to the President at 8:30 A. M., immediately after chapel exercises, for enrollment.

For further information apply to M. L. Ward, President *pro tem*, Manhattan, Kansas.

LITERARY SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in the College Chapel every Friday at 2 P. M. Ladies admitted. New students cordially invited to attend. GEORGE ROSE, President.
MISS ROWENA WHALEY, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Telegraph Hall every Saturday evening. Visitors, especially students, always welcome.
NOBLE A. RICHARDSON, President.
GEORGE F. THOMPSON, Secretary.

RAILROAD TIME-TABLE.

KANSAS PACIFIC RAILWAY.

PASSENGER ARRIVES.

No. 2, going East	11:58 A. M.
No. 4, going East	3:28 A. M.
No. 1, going West	4:03 P. M.
No. 3, going West	4:51 A. M.
No. 7 (freight), going West	8:45 A. M.

Nos. 1, 2 and 7 run daily. No. 3 runs daily except Monday. No. 4 runs daily except Sunday. Passengers with tickets are carried on No. 7.
GEO. C. WILDER, Agent.

THE INDUSTRIALIST.

SATURDAY, SEPTEMBER 20, 1879.

Industrial Education.

The real value of an education to the student depends upon two things: First, the practical worth of the knowledge taught; and, second, the degree in which he makes it his own. Hence, the ability of any institution to give a practical education depends upon the kind and aim of the knowledge it teaches, and upon the thoroughness of the instruction therein. The State Agricultural College was directly endowed by Congress, and is guided by the State, for the specific purpose of furnishing to the industrial classes of Kansas a "practical" education, that is, "one fit for use." As its name indicates, and as the statistics of the industries of the State require, its chief work must be that of giving a useful and usable education to those who will engage in farming; and, therefore, the Farmer's Course must, from the nature of the case, be its main one.

FARMER'S EDUCATION.

Words and figures are merely instruments with which to record ideas. They are not themselves ideas, nor should they be made the chief end of an education. As a wagon is necessary to haul grain, so are they a necessary part of an education; but as the wagon is not the grain, so they are not the knowledge which the farmer converts into money. Hence, the classics and higher mathematics are not taught. But it will be noticed in the following course that so soon as the pupil acquires working skill in the use of the English language as a tool, and of figures and lines as mathematical tools, those arts and sciences which present knowledge that has a cash value to the farmer are taught as rapidly as their importance and thorough acquisition will permit. Studies numbered (1) and (4) in the second, third and fourth years are the spine of the course, to which the others are as ribs and muscle.

FARMER'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Practical Agriculture (advanced.)		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	
3. Polit. Economy, Practical Law.		3. Practical Geometry.		3. Algebra.		3. Industrial Drawing.	
4. Zoology.		4. Horticul., Landscape Gardening.		4. Practical Agricul. (elementary).		4. English Structure.	
5. Agricul. Chemistry		5. Organic, Analytical Chemistry.		5. Physics.		5. Adv'd Arithmetic, Book-keeping.	
6. Logic.		6. Practical Surveying.		6. Industrial Drawing.		6. U.S. History, Industrial Drawing.	

WOMAN'S EDUCATION.

Nearly one-half of our students are females, and the Woman's Course is prepared expressly for their liberal and practical education. We have no doubt whatever that practical men and women, who understand what it means and what it seeks to do, will fully endorse it.

WOMAN'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Farm Economy, Special Hygiene.		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	
3. Polit. Economy, Practical Law.		3. Industrial Drawing.		3. Algebra.		3. Industrial Drawing.	
4. Zoology.		4. Horticul., Landscape Gardening.		4. English Literature.		4. English Structure.	
5. Phys'l Geography, Meteorology.		5. Organic, Household Chemistry.		5. Physics.		5. Adv'd Arith., Book-keeping.	
6. Logic.		6. Household Economy.		6. Industrial Drawing.		6. U.S. History, Industrial Drawing.	

MECHANIC'S EDUCATION.

Because of the adaptedness of the leading course to the wants of the intelligent mechanic, it has been found practically unnecessary to diverge from the Farmer's Course. Additional studies, specially adapted to the mechanic's use, will be furnished in a Post-Graduate's Course.

If it be urged that the distinctively agricultural knowledge taught in the Farmer's Course is not directly valuable to the mechanic, we reply that, admitting the point for the purpose of argument, yet: 1. This knowledge is of more practical value to the mechanic than is the Latin, Greek, or a half dozen other things embraced in the usual course preparatory to the professions; 2. That the great majority of Kansas mechanics will also be more or less engaged in agriculture; 3. That those studies in the course which are directly valuable to the mechanic, together with the shop facilities, offer a better mechanic's education than can be elsewhere found west of the Alleghanies.

INDUSTRIAL DEPARTMENTS.

Having knowledge in the head is one thing; ability to use it with the tongue, fingers or feet is quite another thing. Both are vital to success in practical life. A man might thoroughly understand the theoretical principles of carpentry, and yet, not having used the tools, be wholly unable to earn carpenter's wages. So in all other vocations. Accordingly, instruction is given in the following well-equipped Industrial Departments, and every student is required to recite in some one of them, as selected by the pupil or parent:

FOR MALE STUDENTS.	FOR FEMALE STUDENTS.
The Farm.	Dress-making.
The Nursery.	Printing.
Carpentry.	Telegraphy.
Cabinet-making.	Scroll-sawing.
Turning.	Carving.
Wagon-making.	Engraving.
Painting.	Photography.
Blacksmithing.	Instrumental Music.

Each of these departments is conducted exactly as in daily life, and aims to give precisely the drill received by an apprentice. No charge is made, either for tuition or material, from male students taking the Industrials provided for them; nor from female students taking the ones provided for them, except in Instrumental Music. Male students taking either Printing or Telegraphy are charged $1.00 per month for the use of instruments and material.

DEPARTMENTS OF INSTRUCTION.

DEPARTMENT OF AGRICULTURE.

PRACTICAL AGRICULTURE.

Second Year:—General principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage.

Fourth Year: General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of a rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farm-houses; barns.

FARM ECONOMY.

Woman's Course, Fourth Year: Dairy products as human food; influences affecting character of milk; manufacture of condensed milk; the factory system and household plan of cheese-making; treatment of rennet; general process of cheese manufacture; subsequent t eatment of cheese; butter-making; creameries; "deep" and "shallow" setting systems; general process of butter-making; packing and preserving butter.

DEPARTMENT OF BOTANY AND PRACTICAL HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest; also a course of lectures on Landscape Gardening. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard; fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture; shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in in the work of laying out and plotting grounds topographically.

CHEMICAL DEPARTMENT.

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life. Text-book, Ganot.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blow-pipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

Are constantly in progress in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

DRILL IN ENGLISH.

"As grammar was made after language, so ought it to be taught after language."—*Herbert Spencer.*

Drill in English embraces the following topics:

Sounds of the language; drill in producing the vocal, sub-vocal and aspirate elements with accuracy, distinctness and volume; vowels, consonants.

Letters: Form; power; rules for spelling, drill.

Words: Signification, properties, modifications, variations, relation and dependence.

Sentences: Drill in statement of ideas; description, clearness, terseness, vigor; business letters, discussion; capitalization; syllabication; punctuation; construction and analysis of sentences; elements, uses and names; criticism of compositions printed as written; proof reading; grammatical construction; superfluous words and clauses; drill in reading, speaking and penmanship.

Text-books: Webster's Academic Dictionary; Lee & Hadley's Advanced Lessons in Language.

Pupils deficient in spelling, etc., should enter the printing class, the printing-office being the work-shop of language.

STRUCTURE OF ENGLISH.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

MATHEMATICAL DEPARTMENT.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

DRILL IN ARITHMETIC.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Following this line, the student, so far from hammering away at "pure" science draws from the mathematical store-house what he needs, and sees why he needs it. Accuracy of calculation and posting, rather than a *mere* comprehension of the principles, is aimed at. Besides the recitation-room drill in business forms, practice in the field is also given. Estimating the number of cords in a pile of wood said to be 100x4x4 feet is one thing; measuring a pile of wood through which any number of cats may be harmlessly thrown, and in which four-feet sticks are the exception, is quite another and more difficult thing.

ARITHMETIC AND BOOK-KEEPING

Is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides ensuring arithmetical practice, develops practical skill in that important art.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admiral system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study. In addition, constant practice in the application of lines to metal and wood is furnished in the Blacksmith, Carpenter, Turning, Scroll-sawing, Carving, Engraving and Printing shops, and to fabrics in the Sewing Department.

PRACTICAL GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the use of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

PRACTICAL SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

STUDIES SPECIAL TO WOMAN.

Besides the studies already indicated, attention is called to the following:

SPECIAL HYGIENE.

As shown in the course, one term is devoted to the study of Physiology, from the text-book of Dr. J. C. Dalton. This is followed in the fourth year by a course of lectures to young ladies by Mrs. Cripps on the subject of Hygiene, embracing such instruction in hygienic matters as are valuable to woman.

FARM ECONOMY considers those affairs of the farm which usually come under the supervision of the farmer's wife or daughter, and which are not included in "gardening" or "household economy;" such as butter and cheese-making, dairy management, etc. A course of lectures is delivered by the Professor of Practical Agriculture. See heading, "Farm Economy."

GARDENING is included in Practical Horticulture. See heading, "Landscape Gardening."

HOUSEHOLD CHEMISTRY. See heading, "Household Chemistry."

HOUSEHOLD ECONOMY

Follows Household Chemistry and consists of lectures by Mrs. Cripps on the art of house-keeping, embracing cookery, domestic management, and kindred topics. Many elderly gentlemen sufficiently know, and more young gentlemen will duly discover, that systematic knowledge of how cooking ought to be done is luminously different from the ability to do it. Instruction without practice can effect but little. Accordingly, a kitchen laboratory has been completely furnished, and affords every facility for drill in the art of cooking. This drill chiefly differs from that of a kitchen in the respect that after a girl has learned to wash dishes or pare potatoes she is not kept everlastingly at either. After full trial, we have found it just as feasible to give this practice, with profit and pleasure to the pupil, as it is to give laboratory practice in chemistry,—and no more expensive.

Printing!—Daily instruction and drill in the work of a First-Class Printer. The Literary Departments offer a thorough education in the construction and use of the English Language, as employed by the Proof-Reader; in Book-Keeping, and in Industrial Drawing, as the best developer of that taste necessarily exercised by every good Job Printer. The Printing Department is well furnished with all the facilities for a speedy mastery of the art of Printing, and is in charge of a practical printer. Besides regular class instruction in printing, the weekly publication of the INDUSTRIALIST by the Department furnishes advanced students the requisite drill in newspaper work.

THE INDUSTRIALIST

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THE INDUSTRIALIST.

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More Grass Needed.

The folly of Tennessee agriculture, says the *Rural Sun*, is the attempt to cultivate too much land, and lay down too little to grass or permanent pasture. If we take a survey of those countries where agriculture flourishes to the greatest degree, we shall find the greatest thrift and the highest rents in those which have the largest amount of permanent pasturage. In France, fifty-three per cent of the tillable land is sown in grain, while in England only twenty-five per cent is sown. France has twenty-two per cent in grass; England fifty per cent. So great is the improvement in the soil by the superior management of English farmers, that the yield of wheat to each inhabitant in the two countries is almost identical. Every acre in England devoted to grain receives the manure from animals fed off three acres of grass. In France the manure made from each acre of grass has to be spread over two and a half acres of grain. But the profit does not stop with the improvement of the soil. The marvelous improvement in the live stock of England is due more to the superiority of her pastures than to any amenity of climate or situation. Grass is wealth. The affairs of life are so ordered that the greatest agricultural prosperity is inseparable from the culture of the grasses, and land rests in the exact proportion to the attention which is given to the cultivated grasses. It is by no means uncommon to find in England lands for agricultural purposes rating at $1,000 per acre. Irrigated meadows in Lombardy rent sometimes for $100 per acre. One hundred acres of land can be bought in many parts of Tennessee for the sum which is annually paid in Lombardy for the rent of one acre. This truth is suggestive. Disguise as we may, grass is to be our agricultural redeemer; to it we look for a restoration of our worn-out fields, for the improvement of our agriculture, and labor, and stock, and for that degree of leisure upon the farm without which a high degree of intelligence is impossible among farmers.

Many Tennessee farmers seem to think that the greater the amount in cultivation, the larger the profits. Just the reverse, within limits, is true. It is better to enrich and cultivate ten acres of corn that will yield sixty bushels per acre than to cultivate sixty acres that will only yield ten bushels per acre. The profits in one case are very great; in the other there is actual loss. How must this be remedied? The plan is easy. Lay down to permanent pasture every acre that cannot be enriched, and let it lie. It will soon enrich itself, for where land is suffered to remain in grass there are certain natural forces that act in its restoration. A dark brown soil, rich in vegetable matter, accumulates and deepens in proportion to the time the land is allowed to remain in grass. The roots of the grasses penetrate the earth and bring to the surface plant food which was before inaccessible. It is said that the annual production of roots on old grass land is equal to one-fourth of the weight of the hay carried off. The roots and leaves of grass contain saline matters beneficial to vegetation. When grass is burned one-tenth of its weight in ashes remains.—*Colman's Rural World.*

Economic Geology.

The fertility of a district or county is supposed to depend upon its soil. And the fertility of the soil is popularly supposed to depend upon its chemical constitution. When the science of chemistry was first applied to agriculture, it was hailed as a method by which a soil's needs and value could be determined without the expense and trouble of testing it by actual cultivation. As might be expected, the value of the science was, at first, much overestimated. And finally it has been found that, saying nothing at present about the meteorological conditions of the locality, the productions of a soil depend much more on its physical conditions than upon its chemical composition.

It has been found, for example, that two soils can have the same chemical constituents in nearly the same proportions, and one of them be fertile and the other barren. A good way to examine a soil is as follows: Take a small pinch, as large as a pea, and pour upon it some acid,—muriatic is best. The effervescence is due to the presence of carbonates,—generally of lime or magnesia. If the effervescence is slight, it shows that the quantity is small. If the effervescence is violent and continues for some time, it shows the presence of a large quantity of carbonates. Now shake the residue vigorously, in water, and pulverize it. Pour off the material in suspension until the water is clear. The residue will generally be sand. If the sand of the soil is coarse, the residue will be considerable; if very fine, it will almost all have been poured off. If a large quantity of the soil is poured off in suspension, and especially if it feels unctuous, it reveals an excess of clay. Now shake a quantity of the soil vigorously in pure water, in a long tube. It will, on settling, arrange itself in regular strata, with the coarser materials at the bottom.

According to Professor Johnson, "*from ninety-five to ninety-nine per cent of the weight of agricultural plants is derived directly or indirectly from the atmosphere.*" The soil serves, in the main, three important purposes: First, mechanical support; second, to furnish the ash ingredients to the plant; third, as the medium through which must be supplied water, heat, and various gases. A coarse, sandy soil is too porous. It dries out rapidly and gets too hot. A clayey soil *bakes*, after being wet, and *packs*. It also cracks on drying, and in so doing the roots of delicate plants are torn asunder. The size of the particles determines the size of the pores and the amount of surface presented to the various solvents in the soil.

Silicic acid or sand is the common constituent of our western, prairie soils. The bluff soil of western Iowa, which is wonderful in its fertility, contains eighty-two per cent of very fine sand and about ten per cent of carbonate of lime. The mean of three analyses of Iowa soils, by Professor Pope, gave about seventy per cent of sand. All of these last three were from what is known as the drift.

In the course of a large number of analyses of the Ohio bottom-land soils, by Mr. David A. Wells (*See American Journal of Science*, 1852), it was found that, in chemical constitution, they differed but very little from the soils of Massachusetts. And yet, these last were exceedingly sterile, requiring constant manuring in order to grow the most meagre crops. On examining the physical condition of the soils, however, they had nothing in common. The Ohio soils were exceedingly fine-grained, being almost in the form of inpalpable powder, while the Massachusetts soils were remarkable for their coarse-grainedness. It would seem, then, that a physical analysis of a soil is fully as important as the chemical, if we would judge respecting its fertility. The soils of Iowa are of three kinds,—in general, the bluff deposit, the drift, and alluvium or altered drift. All are remarkable for their matchless fertility, and all are noted for the exceeding fineness of their constituent particles.—*The College Quarterly.*

IT is stated that the United States will produce, this year, over one million tons of rails, or more than was manufactured in 1872, the year before the panic.

Large Farming a Precarious Business.

The following figures are given by a San Francisco correspondent of a Philadelphia paper, as evidence that farming on a gigantic scale is profitable neither to the country nor the farmer. He says: The "largest wheat producer in California, or in the world, is Dr. H. J. Glenn. He was formerly from Monroe county, Missouri. He is a man of great enterprise and energy. His ranch lies in Colusa county, and comprises 60,000 acres, nearly all arable land. He has this year 45,000 acres in wheat, which, at a low calculation, will produce 900,000 bushels. His wheat will sell for 85 cents per bushel, or $765,000. Dr. Glenn has been farming ten years, and one would suppose he ought to have a handsome sum to his credit in bank; but what with a failure of crops—which occurs two years in every five—and the enormous interest he pays on his loans, he is said to owe a round million of dollars. Last year his credit was bad, as he had no crop. Now, with his splendid crop in prospect, he will probably get out. The Dalrimples of St. Paul, who, ten years ago, were the largest farmers of wheat in Minnesota, raising as much as 40,000 bushels in a single year, went to the wall. Another large wheat-raiser is D. M. Reavis, whose land lies on the borders of Colusa and Butte counties. He is also from Monroe county, Missouri, and has an unpretending little estate of 15,000 acres, 13,000 of which are in wheat, which he thinks will average this year 30 bushels, or 390,000 bushels in all. He also is hard pressed, and I am told is paying 9 per cent on a couple of hundred thousand dollars of borrowed money. If farmers raising half a million to a million bushels of wheat cannot get out of debt, it might be well to inquire what is the use of having so much land? The truth is, that from the frequent failures of crops in California, and the waste that attends on large operations of that kind, farming on a gigantic scale in this portion of the Pacific coast must be considered a failure. North of this, in Oregon and Washington Territories, there is no failure of the harvest; farming operations are carried on on a smaller scale, and consequently the farmers, while not rolling in wheat, are all well to do."—*Exchange.*

THE area in spring wheat in Kansas this year is 412,139 acres. The area in oats is 573,982 acres. The area in timothy, clover, millet and blue-grass is 139,376 acres, and in meadow and pasture 484,019 acres. The total area in all farm crops is 7,757,130 acres,—an increase during the past year of 1,349,614 acres. The winter wheat crop promises the largest yield per acre ever known in the State. As the population of this State is increasing at the rate of over 100,000 per annum, it is clear that the next United States census will show a population of over 1,000,000. Its growth then in decades will be shown by the figures following: Population in 1860, 107,206; in 1870, 379,497; in 1880, 1,000,000.

The increase in area of cultivation of 1878 over 1877 was over 1,000,000 acres, and the increase of 1879 over 1878, 1,349,615 acres, showing an increase of nearly 40 per cent in the ratio of settlement and improvement. On the first of March last there were 2,444 miles of railroad in Kansas, and it is estimated that 500 miles will be built this year. These figures are more eloquent than words, and tell of the coming power of the Mississipi Valley in national control.—*Exchange.*

FIVE million and six hundred thousand dollars in French gold are prepared for shipment to the United States, and six hundred thousad dollars in German gold arrived in one day this week.

THE INDUSTRIALIST.

SATURDAY, SEPTEMBER 27, 1879.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

Inquiries.

All those readers of the INDUSTRIALIST who are interested in agricultural and industrial matters are cordially invited to send to us any inquiries concerning subjects of interest to them. The INDUSTRIALIST does not know everything, and it makes no claim to infallibility, even in those matters in which it takes a special pride; still, the gentlemen who contribute to its editorial pages have within reach much information not ordinarily accessible, which will be gladly given at the suggestion of our friends. Questions relating to the farm, orchard, forests, insects, plants, domestic animals, minerals, household matters, sale of school bonds, and the affairs of the College in general, will be promptly answered. Letters respecting —

The College or sale of bonds, send to....M. L. WARD.
The farm and domestic animals.....E. M. SHELTON.
Minerals and chemical analysis.....G. H. FAILYER.
Horticulture, plants and insects.....E. A. POPENOE.
Household matters.....MRS. M. E. CRIPPS.

The Present Term.

The whole number of students enrolled this term is 187, which is 41 more than was enrolled at a corresponding date one year ago. The number of males is 135; females, 52. Six States besides Kansas are represented, as follows: Iowa, 2; Illinois, 1; Missouri, 3; Massachusetts, 2; New York, 1; Ohio, 1. Thirty-nine counties of Kansas are represented, as follows:

Allen	1	Marshall	1
Anderson	4	McPherson	1
Barton	2	Miami	3
Brown	1	Mitchell	1
Butler	8	Montgomery	2
Chautauqua	1	Morris	3
Cherokee	12	Nemaha	10
Clay	4	Osage	1
Cowley	5	Ottawa	1
Crawford	1	Pottawatomie	6
Davis	2	Riley	*45
Dickinson	4	Rush	1
Douglas	1	Saline	3
Greenwood	5	Sedgwick	2
Jackson	2	Shawnee	15
Jefferson	5	Sumner	1
Jewell	2	Wabaunsee	5
Johnson	8	Washington	1
Lyon	4	Wilson	2
Marion	1		

*Only 19 of these are from Manhattan.

Seventy-three of the whole number in attendance have been enrolled previous to this term. One hundred and fourteen are new students, of whom ninety-four were present on the first day of the term. Without exception, all are hard at work; not a single student up to this time has been reported as "shiftless." Students are arriving daily, and our number will soon reach two hundred.—*Prof. Ward.*

Does it Pay to Study?

President-elect Fairchild made a short address in Chapel on Monday morning last. If this address is a fair specimen of Prof. Fairchild's "talks," the students of the Agricultural College have many rich treats in anticipation. Asking the question, "Does it Pay to Study?" the Professor proceeded to show how it pays in several ways.

First: It pays pecuniarily. Statistics show that even among the class of common laborers, those who have taken a course of study one, two or three years beyond the common schools, command from one-fourth to one-third higher wages than those not taking it.

Second: It pays to take a course of study because it gives a man influence in society. The offices in our towns, counties and States are generally filled by men who have taken a course of study. In the Legislature of Michigan two years ago, more than one-half of the members had taken a course of study; and this half embraced, not only the most influential, but the youngest members of the body.

Third: It pays to take a course of study because it increases one's capacity for enjoyment. It also enables one to do more for others.

Fourth: A course of study in College shapes the fashion of our lives. It teaches us self-control; or, as Huxley states the result of the discipline of study: "It enables us, when necessary, to do what we don't want to do at the time when we don't want to do it." Thus disciplined and trained for work, every man becomes a power in the world.

But we have not space for a full report. The address, from beginning to end, bristled with good points, and was thoroughly appreciated by the students. REPORTER.

Popular Education. No. I.

"Whatever should enter into the life of the nation should be taught in the public schools," is a fundamental principle in the Prussian system of popular education. It was by an application of this principle that Bismarck was able, in one generation, to raise Prussia from a feeble province to become one of the great powers of Europe. War was to become the business of the nation, and every young man was trained as a soldier. This became a part of his education; and Prussia, with her immense "*reserve*," was able to dictate terms to France, once the conqueror of Europe.

It is this practical, common-sense view of education which has made Prussia and Switzerland conspicuous among European nations for intelligence and prosperity. If we accept this maxim as correct, a school is not merely a garden, where, under the patient culture of the teacher, a symmetrical growth takes place, but a workshop in which are forged the mighty forces which shape a nation's character. The teacher who accepts this maxim will not be much concerned as to what his pupils may become, but rather what may they become able to do, in the best and broadest sense, by the help of his teaching and example.

Now, we do not wish to be understood as underrating the importance of growth, or of a symmetrical development of all the powers embraced in that "vast complexity," a human being; but we believe that, simultaneous with this development, and superimposed upon it, there should be, as far as possible, the actual doing of the thing known. The doing sustains the same relation to the knowing how to do as does the fruit to the well-developed tree. The tree of itself is not the thing valued, but the fruit which grows upon it.

So an education is to be valued, not for its beauty or its magnificent proportions, but for what it produces,—for the fruit it bears. This is the true test of a system of education in a country, of a course of study in a college, or of the educational attainments of an individual.

In subsequent articles, we will consider the extent to which the Prussian maxim is recognized in our system of popular education.—*Prof. Ward.*

Hints Concerning Live Stock.

Every intelligent stock-raiser knows that there is greater risk, and more danger of loss, in handling cattle during the next two months than during any other like period in the year. We venture to say that, in a vast number of cases, this loss will be quite equal to the gain of the preceding four months; and it requires no effort of the imagination to see that the total loss will reach a most alarming figure. The great source of this loss is to be found in the very worthless character of our wild grasses at this season. Practically, the "range" is worthless from this time on. It is true that there is an abundance of grass, but if we examine it closely, we shall find that it is dry, wiry and innutritious, and cattle can only be driven to attempt its consumption by the whip and spur of starvation. Our wild grasses flourish only in bright sunshine, and under the influence of great heat. They are the last to appear in the spring and the first to abandon us in the autumn; and while during their short lives they are very abundant and nutritious, enduring the drouths of summer better than any of the tame species, yet as soon as the sun begins to lose its power and the nights become chilly, they rapidly become woody and worthless. If October and November are to be past without great loss to the stock-raiser, prairie pastures must be supplemented with grain or fodder, or both.

DRY MURRAIN — IMPACTION.

Another source of great loss to Kansas stock-raisers is the disease named at the head of this paragraph. The symptoms of this complaint are too well known to need repetition here. Impaction may be occasionally cured; but so rarely does it yield to treatment that it may be safely said that, after the animal has once come fully under the influence of the disease, the case is hopeless. Our only hope lies in preventing the spread of the disease throughout the herd, by cutting them off at once from the feed which originated the complaint. Remember it is woody, innutritious and indigestible grass and corn-stalks which induce the dry, feverish condition of the manifold, which we call impaction. Before cattle are turned upon the coarse grass of the prairie or the stalk-field, they should always be watered and fed; and even then they ought not to be allowed access to this rubbish longer than two or three hours at a time.

HOW TO MAKE CHEAP BEEF

was forcibly brought to our attention by a conversation had with a resident of this city. This gentleman had just sold forty head of "yearlings"— average age of the lot being under fifteen months — whose weight averaged 804 pounds. The price obtained was nearly $27.00 per head. This certainly is an excellent showing; and after listening to the above facts, we promptly asked how this was done. The reply was that these calves came from good stock, and they had been "kept growing from the start." This brief sentence is really the whole philosophy of the manufacture of cheap beef. It is the law and the profits. Good blood is a good thing, and indispensable to successful stock-raising; but it alone will not insure success: this can only come from the union of "pedigree and the swill-pail."

Another matter in connection with this stock is worth attention. They were sold at the most profitable age. The owner obtained the benefit of two summers' feed on the range, with only one winter's feeding; and it should be remembered that for all this feed these young animals would give much better returns than three-year-olds or even two-year-olds. Now, if last winter these calves consumed twenty bushels of corn, worth now $4.00, does any one suppose this did not increase their value more than twice $4.00 worth?—*Prof. Shelton.*

THE State Superintendent, A. B. Lemmon, states that, in the event school-district boards have not completed the work of adoption and introduction of school books by the 16th of September, 1879, the date of the expiration of the new school law, it is their duty and right to proceed until the work is completed.

THE INDUSTRIALIST.

SATURDAY, SEPTEMBER 27, 1879.

Instead of the usual circular or catalogue, we send the Industrialist to those desiring information about the Kansas State Agricultural College. We would call attention to the articles headed "Departments of Instruction," "Industrial Education," "Special Advantages," and "Directions to Applicants." If further information is desired, address Agricultural College, Manhattan, Kansas.

And still they come. Twenty-four students have been enrolled this week. There are more persons attending the College now than at any previous time since the Institution was established.

Prof. Fairchild started for his home in Michigan on Monday. During his stay here he made friends of every one with whom he came in contact. He expressed himself very agreeably disappointed in all that he saw.

We have a Jersey heifer that is a veritable "poor man's cow," and one of the best of her valuable sort. She is a grand milker; and, although less than four years old, she has recently dropped her third heifer calf.

A gentleman who is thoroughly familiar with all the agricultural colleges, said to us recently: "There are really only three agricultural colleges in America." It is, perhaps, needless to say that our own is one of the three.

Of the forty-five students from Riley county, nineteen only live in Manhattan; and most of these are in advanced classes. Last year, next to Riley, Cherokee county was best represented; but this year Shawnee takes the lead.

Since our lawns have received their third mowing, they look very pretty, so every one says. Orchard-grass, sowed thickly and kept closely mowed, makes a rather coarse but very prettily-colored turf. It is the best for Kansas.

Hauling manure has been the business on the farm during the past week; and a good deal of vigorous exercise has been put in on this malodorous subject. All told, 222 two-horse loads have been hauled to the field, mostly to field No. 6.

Gen. Thos. W. Conway, for six years Sup't of Public Instruction in the State of Louisiana, made us a call last Tuesday. The General expressed himself as highly gratified with the general plan of the Institution, saying, "It is just the thing for this day and age of the world."

As predicted last week, the increased number of students has forced us out of the chapel room in the Laboratory Building. Hereafter the morning exercises will be held in the second story of the building formerly used for recitation purposes. This change puts us back where we were a year ago.

During the past week the Loan Commissioner has purchased the following school bonds: Of Dist. No. 52, Morris Co., $200; of No. 91, Cloud Co., $225; of No. 85, Franklin Co., $700; of No. 96, Sedgwick Co., $400: whole amount, $1,525. He pays the face of the bonds and fills out blanks when the data are furnished.

Prof. Platt's division of the Drill in English class contains fifty-three members. They are now vigorously writing their thoughts about a picture which the Professor has shown them. These papers will first be criticised by the members of the class, and afterwards by the Professor, in order to teach them how to write good English.

The following is the list of visitors at the College for the week ending Friday, September 26th, 1879: J. H. Stocking, Onarga, Ill.; S. D. Strong, W. J. Peel, Irving; Thomas Shaw, Wm. Lewis, E. B. Fryer, Randolph; D. A. Brainard, Chicago; Geo. T. Fairchild, Lansing, Mich.; Rev. Greene and wife, Waterville; Mrs. Gill, Prof. Lee, Manhattan; Mrs. Cassteel, Paola; Gen. Thos. Conway, Vineland, N. J.; Mrs. J. Coburn, Salina.

On Saturday last we were favored with a visit from Mr. H. E. Libby, for some time on the editorial staff of the *Scientific Farmer* and the *American Agriculturist*, and now editor of the *Land and Home*, of New York. Mr. Libby is desirous that the *Land and Home* shall become the medium for the interchange of ideas among the agricultural colleges, and has arranged for regular contributions from our own. Mr. Libby expressed great surprise and pleasure at the progress and prospects of this College.

Among the visitors at the College farm on Saturday last was Mr. Jno. Davis, the well-known editor of the Junction City *Tribune*, who was in attendance at the Greenback Convention. We have never talked politics with Bro. Davis, and don't intend to, for we probably should not agree; but on farm and stock matters we reach common ground, and the way Mr. Davis talks and listens shows that the farmer in him cannot be kept down, and makes his rare visits here always a source of pleasure to us.

Since our last issue, the following students have been enrolled, making a total of one hundred and eighty-seven since the term commenced: *Andersen county*—Grant Selby and Belle Selby; *Cherokee*—C. C. Chenoweth; *Clay*—Selma Ehrsam and W. J. Cowell; *Cowley*—Sumner J. Zerger; *Dickinson*—John D. Hartmann; *Jefferson*—Hiram Miller and John T. Copley; *Johnson*—Wm. W. Hulett; *Nemaha*—Joseph B. Lohmuller, Wm. McBratney, Clara McBratney, and Charles F. Randel; *Pottawatomie*—Charles W. Neiman; *Riley*—James Shaw; *Saline*—Jennie E. Coburn; *Shawnee*—Thomas Andrews, John C. Mauney and William H. Foss; *Crawford*—William A. Young; *Butler*—Samuel B. Berry; *Allen*—Wirt S. Myers; *Marion*—J. W. Hamilton.

The Webster Society met in Telegraph Hall last Saturday evening, a large number being present. Nine names were handed to the board of directors as candidates for membership. Officers were then installed. Valedictory by the retiring President, and a terse, sensible inaugural by Mr. Richardson, the President-elect. Owing to the press of other business, the order of extemporaneous speaking was passed. Declamation, by M. A. Reeve, which was well delivered; composition, by A. H. Allen; *Reporter*, by C. E. Wood. Question for debate next evening: "*Resolved*, That Americans are less patriotic than the Germans." *Reporter* in two weeks by L. W. Call. The Society wishes to acknowledge the receipt of several books from Mr. Rushmore. Society adjourned to meet Saturday evening at half-past seven instead of eight, as heretofore.

WOOD.

The Alpha Beta Society met Friday afternoon. A large number of members were present. The order of music was filled by a well-selected song, rendered by an able committee. The singing has become a permanent thing in the Society and is a grand advantage. After a closely-contested vote, the order of debate was passed, on account of the unusual amount of business to be transacted. Miss Whaley read an interesting essay, which very ably reviewed the advantages of newspapers, and gave a short sketch of the history of that wonderful thing—the newspaper. During extemporaneous speaking a large number of good questions were discussed; and we suppose the enthusiasm of San Francisco must have penetrated the Society, for Grant was almost unanimously upheld as a candidate for 1880. About twenty books were ordered for the Society library. Three persons were initiated. Come out next Friday and hear the *Gleaner*. Although we do not believe in unnecessary red tape, we are not ashamed to acknowledge our badge as the old, tried and true,—red, white and blue.

BLAIN.

ENTERPRISE ITEMS.

Tomatoes have been coming in by the wagon load this week.

Johnny Winne came down from Salina last Wednesday week, sick with typhoid fever.

John Kent has returned from his geological expedition. Frank Williston stayed to farm in Graham county.

Double A. Stewart says, "look out for serenades." Part of that orchestra lives on this street, and toots an old brass trumpet. Al might warn him to look out for something more tangible than a serenade.

Walter Griswold, of Wabaunsee, pulled a sandbur from his coat sleeve with his teeth, a short time ago. One of the splinters entered his tongue, and in a short time it swelled nearly out of his mouth. Dr. Patee cut the bur out, and Griswold is getting well.

NATIONALIST ITEMS.

Irish potatoes are very scarce in the market, many of the fields planted last spring not "panning out worth a cent." Sweet potatoes are plenty and cheap.

While trimming trees last Wednesday, Capt. Todd cut his foot severely with an ax. A doctor was called immediately, and at last accounts the wound was in a fair way to heal.

Louis, oldest son of Rev. R. D. Parker, was thrown from a horse Wednesday afternoon, and the back of his head laid open to the bone, but the indications are favorable for his recovery.

President Fairchild, who has been in town a few days since our last issue, returned to Michigan Monday, well pleased with what he saw here. He will not decide until he has reached home whether or not he will accept the position tendered him. His appearance indicates that he is a gentleman and a scholarly man of more than ordinary ability.

Last Saturday we enjoyed a very pleasant half-day's ride about the grounds of the State Agriculture College, in the family carriage of Prof. Gale. The grounds about the old building are very interesting, on account of the young forest planted some years ago, and now coming on without special care. Orchards, vineyards and forests are growing on the new grounds about the College buildings now occupied.

We visited the barn and the pastures: saw Shorthorns, Galloways, Jerseys and Berkshires. Also met Prof. Shelton, who has chage of the farm and animals. He is an enthusiastic and intelligent gentleman, and we should think eminently fitted for his position as Professor of Agriculture. We also met Prof. Geo. T. Fairchild, the newly-appointed President, Hon. S. M. Wood, and others. It was Saturday, and classes were not reciting.—*Junction City Tribune.*

DIRECTIONS TO APPLICANTS.

TERMS OF ADMISSION.

Candidates for admission must be fourteen years of age, and pass a satisfactory examination in reading; arithmetic, through decimal fractions; and English grammar, to syntax. Classes are started at the beginning of each year in Drill in Arithmetic and Drill in English; and the pupil must have the knowledge above indicated, else he will be unable to retain position if admitted.

Pupils will be received at any time during the year, if able to pass an additional examination upon the subjects studied by the classes which they expect to enter. But they will find it greatly to their advantage to be present at the opening of each term, or as soon thereafter as posssble.

GRADES.

Both the Literary and Industrial recitations are graded daily upon a scale of 100; and an examination of all classes is made at the close of each month. A student not attaining an average grade of sixty is promptly dropped to a lower class, or excluded from the Institution until able to do so. The work of grading is strict and uniform in all the departments, and this process is rigorously used for sifting out incompetent and indolent pupils; thus more than accomplishing all that is designed to be effected by a "high standard of admission." Hence, the student's continuance in the College wholly depends upon his own action.

The course is based upon the determination to make the labor required in the preparation of one industrial and three literary recitations as much as the average student can perfectly perform, in ten hours a day. We design to give the pupil the worth of the time expended at College; and, in order thereto, he must do a full day's work with brain or hand. Only those students who can maintain a standing of ninety in each study will be allowed to take more than the prescribed number of recitations; and no one will be permitted to have less than one industrial and three literary recitations.

RELIGIOUS.

Unless otherwise directed by parents, students are required to attend chapel at 8:30 A. M. on academic days, and divine service once every Sabbath.

EXPENSES.

There are no charges whatever for enrollment, attendance or instruction in the regular courses; nor are there any "contingent fees" for the repair of buildings, for the use of books or apparatus, for diplomas, or the kindred privileges usually grouped under the term "contingent." Male students are furnished instruction, the use of apparatus, instruments or tools, in both the literary and industrial classes marked out for them, without any charge. And the same is true of female students in the regular classes provided for them. Printing and Telegraphy are industrials primarily provided for the education of female students, and male students taking either of these are charged $1 per month for use of instruments.

Instrumental music is a fine art or "accomplishment," rather than a mechanical art. We do not place it among our "industrials" in the same sense, or for the same purpose, that we do those provided for teaching the trades. Accordingly, the following fee is required from female students for tuition and the use of instruments:

Terms per week:

Private lessons, 2 a week, on any instrument, $1.00
Private lessons, 1 a week, on any instrument, .60
Class lessons, 2 a week, on any instrument, .65

Instruction in harmony, etc., etc., from ten to fifty cents per week, as the student may or may not be in other classes.

The only charge made for material in either the literary or industrial departments is for the chemicals used by students in laboratory practice, which are furnished at wholesale prices, and amount to but a small sum.

Furnishing an absolutely free education is as much as can be reasonably asked; and the Institution neither boards, clothes, nor supplies the student with text-books. Boarding can be obtained in private families at from $2.75 to $4 per week. Washing costs from seventy-five cents to one dollar per dozen. Text-books, which can be procured in Manhattan, cost from $2 to $5 per term.

No student need expend over $5 per week; and many of our best pupils are living at $1.25 per week. Students desiring to "board themselves" can do so at from $1 to $2 per week. In a club of four young men, renting a house, the average cost to each for the term was $1.11 per week.

LABOR.

Manual labor by the students may be for either of two purposes: First, to acquire skill in a given art; second, to earn money. In the first case, the labor is educational; in the second, it should be paid for by the party benefited.

Educational Labor.—Manual labor in the reciations of the Industrial Departments, like mental labor in those of the Literary Departments, is purely educational and will not be remunerated. While the interest of the student will be held paramount in the direction of this labor, the practice necessary to dexterity will be required.

Remunerated Labor.—When the Institution needs labor on the Farm or elsewhere which is not educational, but simply for its own profit, and which a student is able and willing to perform, it becomes an employer instead of a teacher, and he an employe instead of a scholar. It pays for work, he works for pay. The relation between them is commercial, not educational; and both parties must act upon business principles. Hence, the College furnishes only such employment as its own interests require, and will pay according to the value of the service rendered at from seven to ten cents an hour.

AMOUNT EARNED.

It is impossible to predict how much a given person can earn, since that depends upon what he can do and what work there is to be done. Hence, it is wholly impossible for us to answer the question so often asked: "Do you think I can meet my expenses by work?" Some students make one-half their expenses, some the whole, and exceptional men have made more than expenses. As a rule, a faithful boy skilled in farm work can earn half his expenses on the Farm or in the Nursery. During the year he can ordinarily acquire sufficient skill in the wood or iron shops to enable him to make articles for sale. The whole question is one for his own consideration and decision. We can teach all who come, but cannot absolutely *promise* anything more. Hitherto we have refrained from holding out strong inducements respecting the amount of labor we might have to offer; but in view of the fact that during each of the last three years we have had more to do than the students could perform, we are inclined to give greater and positive encouragement on this point. Any boy who is in dead earnest, who is familiar with farm operations, and who can raise $50 to start with, should be able to carry himself through the four years' course. And certainly this places an education within the reach of every determined boy. As yet we are unable to offer similar advantages to girls, not requiring labor in the College departments which they can perform.

RULES.

1. Behave as a true man or woman should, at all times and in all places.

2. Attend to your own business promptly, thoroughly and courteously; and vigorously let alone that of other people.

3. Penalty: "Leave!"

PUBLICATIONS.

The "Hand-Book," published in 1874, containing a full discussion of the educational question and the aims of the Institution, will be forwarded to any one desiring it.

THE INDUSTRIALIST, a weekly journal edited by the Faculty and published by the Printing Department, contains original and seasonable articles on the Farm, Orchard, Trades, Sciences, and Education. Price, 75 cents a year. Address A. A. Stewart, Manhattan.

CALENDAR.

Fall Term, 1879.—Began Wednesday, September 10th, 1879, and will close December 18th, 1879.

TO NEW STUDENTS.

Bring the text-books you have been using. On arrival, first arrange for your boarding. A. A. Stewart will furnish information, either by letter or on application, concerning boarding places or rooms for rent. Report to the President at 8:30 A. M., immediately after chapel exercises, for enrollment.

For further information apply to M. L. Ward, President *pro tem*, Manhattan, Kansas.

LITERARY SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in the College Chapel every Friday at 2 P. M. Ladies admitted. New students cordially invited to attend. GEORGE ROSE, President.
MISS ROWENA WHALEY, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Telegraph Hall every Saturday evening. Visitors, especially students, always welcome.
NOBLE A. RICHARDSON, President.
GEORGE F. THOMPSON, Secretary.

RAILROAD TIME-TABLE.

KANSAS PACIFIC RAILWAY.

PASSENGER ARRIVES.

No. 2, going East..... 11:58 A. M.
No. 4, going East..... 3:28 A. M.
No. 1, going West..... 4:03 P. M.
No. 3, going West..... 4:51 A. M.
No. 7 (freight), going West..... 8:45 A. M.

Nos. 1, 2 and 7 run daily. No. 3 runs daily except Monday. No. 4 runs daily except Sunday. Passengers with tickets are carried on No. 7.

GEO. C. WILDER, Agent.

THE INDUSTRIALIST.

SATURDAY, SEPTEMBER 27, 1879.

Industrial Education.

The real value of an education to the student depends upon two things: First, the practical worth of the knowledge taught; and, second, the degree in which he makes it his own. Hence, the ability of any institution to give a practical education depends upon the kind and aim of the knowledge it teaches, and upon the thoroughness of the instruction therein. The State Agricultural College was directly endowed by Congress, and is guided by the State, for the specific purpose of furnishing to the industrial classes of Kansas a "practical" education, that is, "one fit for use." As its name indicates, and as the statistics of the industries of the State require, its chief work must be that of giving a useful and usable education to those who will engage in farming; and, therefore, the Farmer's Course must, from the nature of the case, be its main one.

FARMER'S EDUCATION.

Words and figures are merely instruments with which to record ideas. They are not themselves ideas, nor should they be made the chief end of an education. As a wagon is necessary to haul grain, so are they a necessary part of an education; but as the wagon is not the grain, so they are not the knowledge which the farmer converts into money. Hence, the classics and higher mathematics are not taught. But it will be noticed in the following course that so soon as the pupil acquires working skill in the use of the English language as a tool, and of figures and lines as mathematical tools, those arts and sciences which present knowledge that has a cash value to the farmer are taught as rapidly as their importance and thorough acquisition will permit. Studies numbered (1) and (4) in the second, third and fourth years are the spine of the course, to which the others are as ribs and muscle.

FARMER'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Practical Agriculture (advanced.)		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	
3. Polit. Economy, Practical Law.		3. Practical Geometry.		3. Algebra.		3. Industrial Drawing.	
4. Zoology.		4. Horticul., Landscape Gardening.		4. Practical Agricul. (elementary).		4. English Structure.	
5. Agricul. Chemistry	Meteorology.	5. Organic, Analytical Chemistry.		5. Physics.		5. Adv'd Arithmetic, Book-keeping.	
6. Logic.		6. Practical Surveying.		6. Industrial Drawing.		6. U.S. History, Industrial Drawing.	

WOMAN'S EDUCATION.

Nearly one-half of our students are females, and the Woman's Course is prepared expressly for their liberal and practical education. We have no doubt whatever that practical men and women, who understand what it means and what it seeks to do, will fully endorse it.

WOMAN'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Farm Economy, Special Hygiene.		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	
3. Polit'l Economy, Practical Law.		3. Industrial Drawing.		3. Algebra.		3. Industrial Drawing.	
4. Zoology.		4. Horticul., Landscape Gardening.		4. English Literature.		4. English Structure.	
5. Phys'c'l Geography, Meteorology.		5. Organic, Household Chemistry.		5. Physics.		5. Adv'd Arith., Book-keeping.	
6. Logic.		6. Household Economy.		6. Industrial Drawing.		6. U.S. History, Industrial Drawing.	

MECHANIC'S EDUCATION.

Because of the adaptedness of the leading course to the wants of the intelligent mechanic, it has been found practically unnecessary to diverge from the Farmer's Course. Additional studies, specially adapted to the mechanic's use, will be furnished in a Post-Graduate's Course.

If it be urged that the distinctively agricultural knowledge taught in the Farmer's Course is not directly valuable to the mechanic, we reply that, admitting the point for the purpose of argument, yet: 1. This knowledge is of more practical value to the mechanic than is the Latin, Greek, or a half dozen other things embraced in the usual course preparatory to the professions; 2. That the great majority of Kansas mechanics will also be more or less engaged in agriculture; 3. That those studies in the course which are directly valuable to the mechanic, together with the shop facilities, offer a better mechanic's education than can be elsewhere found west of the Alleghanies.

INDUSTRIAL DEPARTMENTS.

Having knowledge in the head is one thing; ability to use it with the tongue, fingers or feet is quite another thing. Both are vital to success in practical life. A man might thoroughly understand the theoretical principles of carpentry, and yet, not having used the tools, be wholly unable to earn carpenter's wages. So in all other vocations. Accordingly, instruction is given in the following well-equipped Industrial Departments, and every student is required to recite in some one of them, as selected by the pupil or parent:

FOR MALE STUDENTS.	FOR FEMALE STUDENTS.
The Farm.	Dress-making.
The Nursery.	Printing.
Carpentry.	Telegraphy.
Cabinet-making.	Scroll-sawing.
Turning.	Carving.
Wagon-making.	Engraving.
Painting.	Photography.
Blacksmithing.	Instrumental Music.

Each of these departments is conducted exactly as in daily life, and aims to give precisely the drill received by an apprentice. No charge is made, either for tuition or material, from male students taking the Industrials provided for them; nor from female students taking the ones provided for them, except in Instrumental Music. Male students taking either Printing or Telegraphy are charged $1.00 per month for the use of instruments and material.

DEPARTMENTS OF INSTRUCTION.

DEPARTMENT OF AGRICULTURE.

PRACTICAL AGRICULTURE.

Second Year:—General principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage.

Fourth Year: General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of a rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farmhouses; barns.

FARM ECONOMY.

Woman's Course, Fourth Year: Dairy products as human food; influences affecting character of milk; manufacture of condensed milk; the factory system and household plan of cheese-making; treatment of rennet; general process of cheese manufacture; subsequent t eatment of cheese; butter-making; creameries; "deep" and "shallow" setting systems; general process of butter-making; packing and preserving butter.

DEPARTMENT OF BOTANY AND PRACTICAL HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest; also a course of lectures on Landscape Gardening. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard; fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture; shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in in the work of laying out and plotting grounds topographically.

CHEMICAL DEPARTMENT.

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life. Text-book, Ganot.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blowpipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

Are constantly in progress in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

DRILL IN ENGLISH.

"As grammar was made after language, so ought it to be taught after language."—*Herbert Spencer.*

Drill in English embraces the following topics:

Sounds of the language; drill in producing the vocal, sub-vocal and aspirate elements with accuracy, distinctness and volume; vowels, consonants.

Letters: Form; power; rules for spelling, drill.

Words: Signification, properties, modifications, variations, relation and dependence.

Sentences: Drill in statement of ideas; description, clearness, terseness, vigor; business letters, discussion; capitalization; syllabication; punctuation; construction and analysis of sentences; elements, uses and names; criticism of compositions printed as written; proof reading; grammatical construction; superfluous words and clauses; drill in reading, speaking and penmanship.

Text-books: Webster's Academic Dictionary; Lee & Hadley's Advanced Lessons in Language.

Pupils deficient in spelling, etc., should enter the printing class, the printing-office being the work-shop of language.

STRUCTURE OF ENGLISH.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

MATHEMATICAL DEPARTMENT.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

DRILL IN ARITHMETIC.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Following this line, the student, so far from hammering away at "pure" science draws from the mathematical store-house what he needs, and sees why he needs it. Accuracy of calculation and posting, rather than a *mere* comprehension of the principles, is aimed at. Besides the recitation-room drill in business forms, practice in the field is also given. Estimating the number of cords in a pile of wood said to be 100x4x4 feet is one thing; measuring a pile of wood through which any number of cats may be harmlessly thrown, and in which four-feet sticks are the exception, is quite another and more difficult thing.

ARITHMETIC AND BOOK-KEEPING

Is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides ensuring arithmetical practice, develops practical skill in that important art.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admiral system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study. In addition, constant practice in the application of lines to metal and wood is furnished in the Blacksmith, Carpenter, Turning, Scroll-sawing, Carving, Engraving and Printing shops, and to fabrics in the Sewing Department.

PRACTICAL GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the use of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

PRACTICAL SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

STUDIES SPECIAL TO WOMAN.

Besides the studies already indicated, attention is called to the following:

SPECIAL HYGIENE.

As shown in the course, one term is devoted to the study of Physiology, from the text-book of Dr. J. C. Dalton. This is followed in the fourth year by a course of lectures to young ladies by Mrs. Cripps on the subject of Hygiene, embracing such instruction in hygienic matters as are valuable to woman.

FARM ECONOMY considers those affairs of the farm which usually come under the supervision of the farmer's wife or daughter, and which are not included in "gardening" or "household economy;" such as butter and cheese-making, dairy management, etc. A course of lectures is delivered by the Professor of Practical Agriculture. See heading, "Farm Economy."

GARDENING is included in Practical Horticulture. See heading, "Landscape Gardening."

HOUSEHOLD CHEMISTRY. See heading, "Household Chemistry."

HOUSEHOLD ECONOMY

Follows Household Chemistry and consists of lectures by Mrs. Cripps on the art of house-keeping, embracing cookery, domestic management, and kindred topics. Many elderly gentlemen sufficiently know, and more young gentlemen will duly discover, that systematic knowledge of how cooking ought to be done is luminously different from the ability to do it. Instruction without practice can effect but little. Accordingly, a kitchen laboratory has been completely furnished, and affords every facility for drill in the art of cooking. This drill chiefly differs from that of a kitchen in the respect that after a girl has learned to wash dishes or pare potatoes she is not kept everlastingly at either. After full trial, we have found it just as feasible to give this practice, with profit and pleasure to the pupil, as it is to give laboratory practice in chemistry,—and no more expensive.

Printing!—Daily instruction and drill in the work of a First-Class Printer. The Literary Departments offer a thorough education in the construction and use of the English Language, as employed by the Proof-Reader; in Book-Keeping; and in Industrial Drawing, as the best developer of that taste necessarily exercised by every good Job Printer. The Printing Department is well furnished with all the facilities for a speedy mastery of the art of Printing, and is in charge of a practical printer. Besides regular class instruction in printing, the weekly publication of the INDUSTRIALIST by the Department furnishes advanced students the requisite drill in newspaper work.

THE INDUSTRIALIST

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Address A. A. STEWART, Manhattan, Kas.

The Lessons of Adversity.

Adversity has its lessons in agriculture not less than in politics, medicine, finance, morals. Of the latter we spoke in a late issue. Of those to be drawn from the present agricultural adversity and distress in England, we spoke at considerable length a week or two before. If that distress shall lead even remotely to a change or modification of the laws of inheritance and entail, of rental of farms and the compensation to be paid to tenants for the "betterments" they make, of forestry and game, etc., which seems to us Americans not only oppressive and unjust to tenants but most unwise even for the landlords,— if this be the result, then that adversity will not have been without its wholesome effect.

In the different parts of our own country, various forms of adversity have at different times taught their various lessons. In parts of New York, some thirty years ago wheat-raising became almost the exclusive industry: soil and climate seemed to favor, and it paid better for a time than anything else. Every available acre for a few years was put to wheat. Not enough stock was kept to return to the soil in manure any adequate proportion of the fertility exhausted by the successive crops. Of course, adversity followed, crops dwindled. The fly, the "winter-kill" (another name for poverty of soil), and the weevil made havoc. Men of our own acquaintance, who had raised two or three thousand bushels of wheat annually, now harvested hardly as many hundreds, and were finally forced to abandon the industry entirely, until the land, as if under the old Mosaic law, had enjoyed its sabbaths of rest. The farmers learned the lesson before the land was exhausted, and now under a wiser system of mixed husbandry, with rotation of crops, and more cattle and sheep, and the freer use of clover and manure, and the careful husbandry of all animal manure, both liquid and solid, the fertility is restored and retained, and even wheat in many cases is yielding nearly its former abundant harvests.

In parts of Illinois the same lesson is hardly yet learned. It was deemed at first that the marvelously deep, black soil had fertility exhaustless, and that manure was needless. Corn after corn, and wheat after wheat were raised and sold off of the farms, the straw and stalks were burned or wasted, and even the manure made by the few head of stock kept on the farms was not properly saved or used. That which collected about the barns was voted a nuisance and seldom carted to the fields. The joke used to be that when the manure-pile grew to be larger than the barn, *the barn was moved to a new spot!* The rich gifts of nature in soil and climate even led to shiftlessness and slovenliness in farming. Of course, reverse would come in time, and already on many farms, and even in whole districts, diminished crops and frequent failures are teaching that the lavish gifts of Nature are not to be abused or overestimated, and that industry, economy, tidiness and thoroughly good farming bring their due rewards there even as in the old and naturally less fertile States.

In the dairy districts of New York and Ohio the farmers are learning a new lesson, or rather the old lesson slightly varied. The high prices of dairy products during and after the war led to over-production. In many sections dairying became the exclusive industry. Every acre was devoted to permanent meadow and pasture, and every animal was a cow and every gallon of milk was jealously taken to the cheese factory. The calves were "deaconed" and not raised. Scarcely an acre was plowed in whole townships, and the farmers bought flour and potatoes for their families, and shorts and grain for their cows and horses. Ordinary and regular farm work almost ceased, except to milk the cows and cut the hay in summer, and feed the cows and cut the fire-wood in winter. With no regular, steady, well-directed labor, men grew shiftless, fences and farms ran down, old meadows ran out. Simple top-dressing did not bring in the lost seed. Plowing, manuring, judicious rotation, and reseeding were needed. Had the price of dairy products remained high, this wretched state of things might have continued till the farms were even worse than run down. Reverse was needed, and the sudden and tremendous decline in prices set men to thinking. It was plain they could not make a living on the old plan, and there must be a change. The creed, that "the cow is better than the plow," began to be doubted. The land long rested from wheat and other grain, and vegetables were found to produce fine crops if properly tilled, especially when tile-drained. More plows and other implements for the *cultivation* of the soil, we are credibly informed, were sold in these dairy regions, in 1877 and 1878, than in *twenty years* just before. The adversity in dairying thrust three lessons before the farmers and forced them to heed them: That farm labor must be regular, persistent, well-directed, and fairly distributed through the year, to meet due rewards; that over-production in any one direction is unsafe; and that in the long run a system of fairly divided mixed husbandry is the best.

But enough of special examples. In general, it may be said that adversity sets men to thinking. It jostles them rudely sometimes, out of the ruts they were mechanically following. It sets them to searching for the causes of failure or distress. It makes them students instead of automatons, men and not machines. It teaches that patient, thoughtful, persistent, well-divided, well-directed effort is sure of reasonable reward.—*Rural New-Yorker.*

THE school committee of Quincy, Mass., of which Charles Francis Adams, Jr., is a member, some time ago began to introduce some reforms in the educational curricula of the town; and, it is said, the results have been very satisfactory. The Boston *Herald* describes some of the changes as follows:

"In the primary schools the old, laborious plan of drilling the alphabet into the uninterested minds of little children is known no more. The pupils learn to read without knowing a letter. The teacher stands at a blackboard, makes pictures and words, talks about them, asks and answers questions, and awakens an interest. The pupils enjoy it. School is robbed of all its terrors. They are allowed ease of position, encouraged, and taught to play. Learning is only another kind of play to them. In short, they are taught to read and write as they learn to walk and talk, by doing it; while the old system is likened to teaching babies didactically how to exercise their muscles, how to put out their feet to walk, how to place their tongues to talk."

How Bessemer Learned.

It will be of interest to the reader to learn that, according to Bessemer's statement, his knowledge of iron metallurgy was at that time very limited, so that he had to get up the whole of the subject. He is now, however, of the opinion that his ignorance proved of great advantage to him, as he had very little to unlearn and could thus approach the subject free from the bias inseparable from those who have followed a beaten track and vainly endeavored to get out of the rut. These words of Bessemer require, however, to be carefully considered.

He does not imply that a state of ignorance would enable him to invent, as many schemers imagine, who put forth crude ideas which are crushed by practical men. He set to work to learn the whole business thoroughly, first from books, and then in the foundries. Still, it will be seen that here was a man well on in the world, who set himself to hard learning, while many of us think that we can do very well without learning at all, or without learning any more. To the public who thus get details at first hand, it is also of interest to know that, having built a small experimental iron works in St. Pancras and begun his preliminary trials, months rolled on, and he spared neither labor nor money, but made failure after failure.

To the wise man, however, failure is a way of learning, and failures are carefully recorded: First, because they show us the way how to save our time by not trying the failure over again; secondly, because they show us, through narrowing the field, in what way we must try; and, thirdly, because they in themselves often suggest some further experiment. Bessemer, indeed, says that during this time of failure he was accumulating many important facts which could not but ultimately be of value to him.—*Exchange.*

The History of Wheat.

It is difficult in the present day to realize the fact that wheat was at one time unknown in America; yet prior to the discovery of this continent by Columbus there was no cereal in America approaching in nature to the wheat plant. It was not, says the *American Miller*, until 1830 that wheat found its way into Mexico, and then only by chance. A slave of Cortez found a few grains of wheat in a parcel of rice, and showing them to his master he was ordered to plant them. The result showed that wheat would thrive well in Mexican soil, and to-day one of the finest wheat valleys in the world is near the Mexican capital. From Mexico the cereal found its way to Peru. Marie D'Escobar, wife of Don Diego de Chauves, carried a few grains to Lima, which were planted, the entire product being used for seed for several successive crops. At Quito, Ecuador, a monk of the order of Saint Francis, by the name of Fray Jodosi Bixi, introduced a new cereal; and it is said that the jar which contained the seed is still preserved by the monks of Quito. Wheat was introduced in the present limits of the United States contemporaneously with the English and Dutch. —*Exchange.*

IT is of importance that a cistern should be properly plastered, in order to make it tight and lasting. A correspondent gives the following directions: Procure one barrel of water-lime as new as possible, and two barrels of clean sand without gravel or small stones; and in a long box of a convenient size mix one part of lime to two parts of sand while dry. When thoroughly mixed, pour in water till it is thin enough to spread, and spread it evenly over the whole cistern. This done, close up the cistern and leave it a week or two to dry. Then mix another pailful of lime with two pailfuls of sand, as before, but make it thin enough to put on with a whitewash brush. Put on this last coat and the job is done.—*Rural New-Yorker.*

AT the St. Rollix Chemical Works in Glasgow, over 2,000 tons of sulphur are annually recovered from aklili waste, the drainings from this refuse product being treated with sulphurous oxide and hydrochloric acid, and the sulphur precipitated. A block of sulphur chrystals over two and a half feet high, obtained from this source, was exhibited at the Paris Exhibition.—*Exchange.*

THE INDUSTRIALIST.

SATURDAY, OCTOBER 4, 1879.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

President Fairchild Accepts.

It gives us great pleasure to be able to announce that Prof. Fairchild has definitely accepted the presidency of this College, and will commence his new work during some part of next month.

THE rain-fall for September was 4.30 inches. It was distributed as follows: On 4th, .45; 11th, 2.03; 28th, 1.72; 30th, .10. The average precipitation at this station for this month is 3.26 inches. It will be seen that the rain-fall during the month just past is 1.04 inches above the average, an excess of 32 per cent. Moreover, on comparing with past years, I find that more water fell in September, 1879, than has fallen in any September since 1874, when 4.53 inches were collected in the rain-gauge. This was at the close of that dry period.

The years included in our records — from 1859 to the present — in which the rain-fall for September has exceeded that of the present year are 1861, 1868, 1870, 1872 and 1874. Each of these cases of excess has followed a light rain-fall.

The temperature has been rather below the average September temperature. The 27th was the warmest day, ninety-two degrees being marked by the mercury on that day. The first and only frost of the season occurred on the 17th.—*Prof. Failyer.*

The Intercrossing of Flowers.

To the investigator in the field of botany, there is presented no more interesting subject of study than the adaptation of the organs of the flower to secure that intercrossing of different blossoms which, in a large number of species, seems to be necessary to assure the vigor and vitality of the seed. Darwin's proposition, that "Nature abhors perpetual self-fertilization," seems to be well supported by the facts developed in the investigations of that eminent naturalist, and also in those of other no less distinguished students, among them Professor Asa Gray, of Harvard College.

A recent perusal of the interesting chapter on the "Adaptations to Fertilization," in the last edition of Professor Gray's botanical text-book has suggested the presentation of a few of the main features to the readers of this paper, to some of whom the ideas may be new and interesting.

Plants may be divided, in reference to the principal means by which intercrossing is accomplished, into wind-fertilized and insect-fertilized. In the first-named division, the fertilizing element, or pollen, is transported chiefly by the agency of the wind from the stamens of one blossom to the pistil of another. The frequent diœcious arrangement of the essential organs; the dry, incoherent character and excessive abundance of the pollen; the usually loosely divided, feathery or hairy stigmas in the pistillate flowers,— these are all adaptations for the ready transportation and reception of the fertilizing element. Hemp, the hop-vine, and most amentaceous trees,— as, the oak, hickory, or walnut, in which, however, the flowers are monœcious,— will present familiar examples of this mode of fertilization, which obtains also in the grasses and cereals.

Those flowers in which the intercrossing is gained through the agency of insects are usually provided with means of attracting these mediators. Showy and bright colors, attractive odors, nectareous secretions,— frequently two or all combined,—evidently subserve this very important end in the economy of the flower. And that the assistance of the insects attracted by such means be accepted to the fullest extent, the two sets of floral organs, stamens and pistils, are frequently separated in time of perfection or maturity, or in position. Let an example be chosen from among familiar plants. Flowers of species of the genus Houstonia (bluets, innocence) will be seen on examination to be formed on two plans: In one, the stamens are long and anthers exserted from the corolla tube, while the pistil is short and the stigma consequently included; in the other and complementary form, the short stamens are included, while the stigma at the tip of the long pistil is exserted. The perfection of this arrangement will be apparent to the observer who notes the action of an insect alighting on the flower. In searching the corolla tube for sweets, the bee will necessarily dislodge upon its body a portion of the pollen from the anthers, whether these are included or exserted; and in visiting a flower of the complementary plan, will apply the pollen-dusted portion of its body to the stigma of that blossom, thus intercrossing the two.

The same end is effected in other blossoms by a different period of maturity in the essential organs of the same flower. In the common figwort (*Scrophularia nodosa*), when the blossom just opens, the pistil, with its mature and receptive stigma, may be observed projecting from the tube of the corolla, while the still unopened stamens are curved backward and are hidden in the throat of the tube. At a later period, the anthers, fully ripened and discharging their pollen, appear in the mouth of the tube, while the pistil, now dry and no longer receptive, is dropped across the lower lip of the corolla. A bee or other flower-seeking insect, having been dusted by the pollen of a flower in the later stage of blossoming, on entering the tube of a young flower, will of necessity bring the fertilizing pollen to the stigma, which is in condition to receive it. In such a case, self-fertilization is next to impossible.

In other species, the order of perfection in the essential organs is reversed, and the stamens are presented in a mature condition and discharge their pollen while the stigma in the same flower is yet too immature for fertilization. The stigma becomes capable of receiving the pollen at a later period, when the anthers have been emptied and are consequently useless. Self-fertilization would here seem equally as difficult as in the reverse order of maturity of the essential organs.

In a third class, where, as in many cases, the stamens and pistil are functionally perfect at about the same time, special means to produce inter-fertilization are found. These are of frequent occurrence in the family of leguminous plants, in some of which the parts of the flower are so arranged that fertilization cannot be accomplished without the interposition of insects, whose weight upon the lower petals causes the extrusion of the pistil and stamens from within the keel, and projects them against the body of the insect. By this means the pollen is discharged from the anthers in such a way that it will be brought to the stigma of the next flower visited, and, under some circumstances, may also reach the stigma in its own flower, when self-fertilization may take place.

Other and equally beautiful adaptations for procuring the intercrossing of different blossoms might be noticed; but enough has been given to indicate the scope of the subject and to show the interest connected with it, and perhaps to direct lovers of flowers to a field for very pleasant and profitable observation.—*Prof. Popenoe.*

The Soil.

The INDUSTRIALIST of last week clipped an article from the *College Quarterly* on "Economic Geology." The article is a very good one, but is likely to give wrong impressions on a few points. It is stated in this article that "two soils can have the same chemical constituents in nearly the same proportions, and one of them be fertile and the other barren." This is true, if by chemical constituents is meant the ultimate elements; but it must not be understood that these elements are similarly combined in the two soils, or that the chemist cannot distinguish between the fertile and the barren soil, without "testing by actual cultivation." The relative value of these soils cannot be definitely determined by any analysis; but, by combining the physical with the chemical analysis, a result, approximately correct, may be obtained. The constituents of the soil may be conveniently classified as follows: The portion that may, at present, be absorbed and assimilated by plants, which may be designated available plant-food; the portion that will soon, by weathering, be rendered soluble and assimilable, and may be called reserve matter; and the remaining inert portions that exert an influence on growing crops only through their physical properties.

It may safely be assumed that by digesting the soil in water available plant-food only will be dissolved. By testing the solution, this portion of the plant-food may be determined. But plants, through their rootlets and the juices they contain, absorb matter that is insoluble in water. Having removed the substances that are soluble in water, the residue may be treated with acids at first dilute but ultimately highly concentrated. The final residue may be considered inert matter that will not submit to the weathering process in the near future. The reserve matter will be dissolved in acids.

The nitrogenous portions of plant-food are the most likely to be deficient, and hence may be considered most important. The free nitrogen of the air cannot be absorbed and assimilated by plants. The compounds furnishing the great supply of nitrogen are quite soluble in water, and will be largely removed from the soil by treatment with this solvent. Although the green parts of plants absorb gaseous ammonia, the soil must be the proximate source of the greater portion of nitrogen. The physical properties of the soil have much to do with the supply of nitrogen furnished the plant; for upon these properties depend its power to absorb and retain gaseous and liquid matters, and the rapidity with which nitrification takes place within the soil.

Much of the prejudice against agricultural chemistry and scientific farming has arisen from false deductions from what is commonly known as "Liebig's Mineral Theory;" viz., that free nitrogen is absorbed by plants,— that the ash ingredients only can be deficient. But Liebig himself was compelled to modify his views before his death, and it would be difficult to find a chemist in this day who would not repudiate these statements.

But this whole subject of soil analysis — chemical and physical — considers only the present conditions of the soil. It can take no note of the changes in texture and composition that are constantly in progress. Its results are only approximate, and there are many factors aside from the direct influence of the soil that determine the fertility of a field.—*Prof. Failyer.*

THE INDUSTRIALIST.

SATURDAY, OCTOBER 4, 1879.

Instead of the usual circular or catalogue, we send the Industrialist to those desiring information about the Kansas State Agricultural College. We would call attention to the articles headed "Departments of Instruction," "Industrial Education," "Special Advantages," and "Directions to Applicants." If further information is desired, address Agricultural College, Manhattan, Kansas.

The classes are all large and doing good work.

The rains for the past week have been acceptable to every body. The total precipitation at this station for the week is 1.82 inches.

We see by the Topeka papers that Regent Challiss has had the misfortune to lose eighty head of his valuable Merino sheep. They either strayed away or have been stolen.

The letter from Maltby, in another column, was a private one and not written for publication; but, believing it will be of interest to the students, we give it a place in the paper.

No. 3 of the Bulletin of the American Berkshire Association, edited by Phil M. Springer, Springfield, Ill., is on our table. The Bulletin is beautifully printed and ably edited, and should be in the hands of every breeder of Berkshires.

We see by the Eureka *Herald* that Mr. A. N. Godfrey, a graduate of this Institution, has been nominated for the office of County Surveyor of Greenwood county. Mr. Godfrey was one of our best and most reliable students, and we know that he will fill satisfactorily any position that he will accept.

We learn from the Lawrence *University Courier* that "Norris M. Grist, who attended the University in '77 and '78, will study at the Manhattan Agricultural College this year;" and that "Mr. R. H. Wright, of Dodge City, Kas., formerly of the Agricultural College, will attend the University this year."

The total number of students has increased this week to 195. The following have reported since our last issue: *Ottawa county*—Ann E. Coolidge; *Cherokee*—Charles Wilson and Elmer E. Wilson; *Johnson*—Marshal N. LaMaster; *Shawnee*—Chas. M. Call; *Riley*—Samuel I. Thackeray and Julia George; *Mitchell*—D. S. Leach.

Visitors will no longer complain of the old "Foster house," or Blood house, as it is sometimes called, which has so long been a blot upon the College grounds. In a cloud of dust, and under the well-directed blows of half a dozen boys, it was nearly demolished during the week, so that now only a small part of the lower story remains standing.

Mr. A. H. Allen, a student from Nemaha county, has the sympathies of all his friends here in his severe bereavement. During the past week, a brother and sister, both older than himself, have died of typhoid fever; and two or three other members of the family are dangerously afflicted with the same disease. Mr. Allen has been excused from the College to go home, and will probably not return this term.

We are furnished by a friend with the following extract from a letter written by Thos. Moore, an old student from Smith county: "I visited Thos. J. Wyland last Sunday, and in the afternoon we called on some of his friends. I think you never saw him farther from dead than he was that afternoon." This will be good news to Mr. Wyland's many friends. No one here doubted the report that he was dead, for it had come from so many sources without a single contradiction.

The Foster house, mentioned in another place, was, we are told, one of the oldest houses in Manhattan. In looking over its queer anatomy, we were forcibly reminded of the hardships of pioneer life. The weather-boards of the wooden wing and all the shingles were oaken "shakes," laboriously made by hand. The timbers were cottonwood, the rafters hackberry, and all the doors and casings were of home-grown walnut. In the entire building, there was less than a wheelbarrow load of "foreign" pine.

Would it not pay some of the moneyed men of Manhattan to erect a few comfortable, but not expensive, dwellings upon the cheap lands adjacent the College farm, with the object of renting the same to members of the Faculty? One of our teachers has been house-hunting in Manhattan for upwards of a month, and so far without success, while others lead a precarious existence in rented houses in Manhattan. We will engage to furnish two tenants (and soon increase the number to four) for such houses, who will pay liberal rents, and hold the houses as long as they keep their present positions.

We notice with pleasure that our *Nationalist* friends are still wrestling with the dictionary. We little thought that our brief line and a half could have provoked all these long, elaborate paragraphs. Our esteemed cotemporary has taken to the study of "elementary English" with the zeal of a freshman, which speaks volumes for the INDUSTRIALIST as a quickener of dormant genius. But, dear friends, do not abandon the old-fogy authorities "all of a heap," so to speak. Disappointment, you know, means defeat of expectation *or* hope, and not "expectation mingled with or accompanied by hope," etc., etc., as in the late lexicographical convulsion.

On Wednesday morning last, Mr. John S. Griffing and Miss Lizzie Pechner were married, by Prof. Lee, in the Episcopal Church. After the ceremony had been concluded, in the presence of a number of invited guests, the happy bride and groom repaired to the home of the former, where numerous handsome and useful presents were received, and an elegant repast served. Mr. Griffing and wife took the noon train for Topeka, within two miles of which, upon a large and well-stocked farm, they will make their future home. We need say nothing about the past history of these estimable young people, for they have lived here since childhood. Mr. Griffing is a graduate of the Class of '77, and his wife attended the College some years. We congratulate them upon the consummation of this long-expected union, upon the good sense displayed in their choice of a vocation, and upon the happy future which lies before them. Surely, the lines have fallen to them in pleasant places.

The Webster Society met Saturday evening in Telegraph Hall. After roll-call and prayer, we debated German *vs.* American patriotism, deciding that our Teutonic brethren can eat longer, sit stiller, and drink more beer on their own hearthstone, *cæteris paribus*, than can Americans of like dimensions; but let it pass, "a hundred years hence we shall all be bald." Extemporaneous speaking was immense, the "third term" being the rallying cry. The Society decided almost unanimously to lend its powerful support—*i. e.*, wind—to U. S. Grant in 1880. Question for next evening: "*Resolved*, That a high position among men is more to be desired than great wealth." Affirmative, Aley and Wood; negative, Fisk and Beacham. Paper, by L. W. Call; declamation, by E. C. Paine; select reading, by J. C. Rust. We meet next Saturday evening in Telegraph Hall, upon which occasion a pleasant time is anticipated.

WOOD.

FROM SALINA.

SALINA, Kas., Sept. 25th, 1879.

Friend Stewart:—Though my subscription to the INDUSTRIALIST expired some time since, the welcome little visitor still appears regularly. Thanks to you for the favor. Please give me credit for the enclosed dollar, from the expiration of last year's time. Though absent in body, I still look to the old—or rather new—College, hoping some day to answer to the ring of its bell and enroll myself again as a student.

I had some hopes of returning this fall, but finally concluded to stay here and become a "Moulder of the Nation's Destiny," by teaching school the coming winter. I have engaged a six months' school which last year had an enrollment of over eighty pupils; so, according to the saying, "Satan finds some mischief still for idle hands to do," his Satanic Majesty will be obliged to excuse me and employ a little extra help during the winter season.

Of course, you will be interested to learn that Bro. William's house will be completed and "ready for occupancy" in about five weeks. The question of occupancy seems to be the only thing remaining to be settled. I suppose you will think that, "This thing he ought to have done and to have left the other undone;" but, nevertheless, if it comes to the worst, perhaps he can "hire a man and his wife," etc. Wait and see.

I forgot to tell you I am putting up a small barn, 24x28 feet, for father. I was just reminded of it by seeing the shingles, which I left on the roof before dinner, blowing away in the direction of the recent Polar Explorations.

But I must close. Believing and hoping that you will have your full share of the enjoyment and work at the College this year, I remain

Your Friend, JAS. C. MALTBY.

The resignation of Hon. John A. Anderson, as President of the State Agricultural College, has finally been accepted, and Prof. Fairchild, of Michigan, appointed in his place. Though nominally holding the position named above for want of a successor, he has drawn no pay since some time previous to his election to Congress. Mr. Anderson made an excellent officer of the College, and is making a sound and sensible Congressman. He may not make quite so many long-winded speeches as some other members, but his judgment is good, and he votes right every time.—*Hutchinson New Era.*

NATIONALIST ITEMS.

Sam Ferguson still keeps open his offer to pay the license and minister's fee for all who will get married at the Fair-ground.

Gen. J. W. Davidson arrived in town last Friday, and will visit Ft. Riley and St. Louis before returning to Ft. Custer. He is looking finely, and reiterated his intention of returning to Manhattan to live next spring.

All the rip-roaring fun of the Fair will be on Wednesday, the second day, when will occur the foot, sack, bicycle and slow-mule races. All who enjoy a genuine, healthy laugh, and innocent sport, should be there.

We understand that the Kansas Central Railroad is now completed fourteen miles west of Onaga, or to Butler. The Leavenworth *Press* says that it will be finished to the Blue River in forty days, and then further westward through Riley and Clay counties.

The surveyors on the M., A. & B. R. R. reached Alma last week, and are now pushing on towards Burlingame. The bonds have been issued and deposited with the State Treasurer at Topeka, and the railroad has deposited the $10,000 in government bonds, as it agreed.

Among the attractions for our stock breeders, at the coming Riley County Fair, are a pair of handsome silver vases, costing $25 each, offered by the Central Kansas Breeders' Association for the best herd of pure-bred cattle and swine on exhibition. These vases will be on exhibition in Floral Hall during the Fair.

DIRECTIONS TO APPLICANTS.

TERMS OF ADMISSION.

Candidates for admission must be fourteen years of age, and pass a satisfactory examination in reading; arithmetic, through decimal fractions; and English grammar, to syntax. Classes are started at the beginning of each year in Drill in Arithmetic and Drill in English; and the pupil must have the knowledge above indicated, else he will be unable to retain position if admitted.

Pupils will be received at any time during the year, if able to pass an additional examination upon the subjects studied by the classes which they expect to enter. But they will find it greatly to their advantage to be present at the opening of each term, or as soon thereafter as posssble.

GRADES.

Both the Literary and Industrial recitations are graded daily upon a scale of 100; and an examination of all classes is made at the close of each month. A student not attaining an average grade of sixty is promptly dropped to a lower class, or excluded from the Institution until able to do so. The work of grading is strict and uniform in all the departments, and this process is rigorously used for sifting out incompetent and indolent pupils; thus more than accomplishing all that is designed to be effected by a "high standard of admission." Hence, the student's continuance in the College wholly depends upon his own action.

The course is based upon the determination to make the labor required in the preparation of one industrial and three literary recitations as much as the average student can perfectly perform, in ten hours a day. We design to give the pupil the worth of the time expended at College; and, in order thereto, he must do a full day's work with brain or hand. Only those students who can maintain a standing of ninety in each study will be allowed to take more than the prescribed number of recitations; and no one will be permitted to have less than one industrial and three literary recitations.

RELIGIOUS.

Unless otherwise directed by parents, students are required to attend chapel at 8:30 A. M. on academic days, and divine service once every Sabbath.

EXPENSES.

There are no charges whatever for enrollment, attendance or instruction in the regular courses; nor are there any "contingent fees" for the repair of buildings, for the use of books or apparatus, for diplomas, or the kindred privileges usually grouped under the term "contingent." Male students are furnished instruction, the use of apparatus, instruments or tools, in both the literary and industrial classes marked out for them, without any charge. And the same is true of female students in the regular classes provided for them. Printing and Telegraphy are industrials primarily provided for the education of female students, and male students taking either of these are charged $1 per month for use of instruments.

Instrumental music is a fine art or "accomplishment," rather than a mechanical art. We do not place it among our "industrials" in the same sense, or for the same purpose, that we do those provided for teaching the trades. Accordingly, the following fee is required from female students for tuition and the use of instruments:

Terms per week:

Private lessons, 2 a week, on any instrument, $1.00
Private lessons, 1 a week, on any instrument, .60
Class lessons, 2 a week, on any instrument, .65

Instruction in harmony, etc., etc., from ten to fifty cents per week, as the student may or may not be in other classes.

The only charge made for material in either the literary or industrial departments is for the chemicals used by students in laboratory practice, which are furnished at wholesale prices, and amount to but a small sum.

Furnishing an absolutely free education is as much as can be reasonably asked; and the Institution neither boards, clothes, nor supplies the student with text-books. Boarding can be obtained in private families at from $2.75 to $4 per week. Washing costs from seventy-five cents to one dollar per dozen. Text-books, which can be procured in Manhattan, cost from $2 to $5 per term.

No student need expend over $5 per week; and many of our best pupils are living at $1.25 per week. Students desiring to "board themselves" can do so at from $1 to $2 per week. In a club of four young men, renting a house, the average cost to each for the term was $1.11 per week.

LABOR.

Manual labor by the students may be for either of two purposes: First, to acquire skill in a given art; second, to earn money. In the first case, the labor is educational; in the second, it should be paid for by the party benefited.

Educational Labor.—Manual labor in the recitations of the Industrial Departments, like mental labor in those of the Literary Departments, is purely educational and will not be remunerated. While the interest of the student will be held paramount in the direction of this labor, the practice necessary to dexterity will be required.

Remunerated Labor.—When the Institution needs labor on the Farm or elsewhere which is not educational, but simply for its own profit, and which a student is able and willing to perform, it becomes an employer instead of a teacher, and he an employe instead of a scholar. It pays for work, he works for pay. The relation between them is commercial, not educational; and both parties must act upon business principles. Hence, the College furnishes only such employment as its own interests require, and will pay according to the value of the service rendered at from seven to ten cents an hour.

AMOUNT EARNED.

It is impossible to predict how much a given person can earn, since that depends upon what he can do and what work there is to be done. Hence, it is wholly impossible for us to answer the question so often asked: "Do you think I can meet my expenses by work?" Some students make one-half their expenses, some the whole, and exceptional men have made more than expenses. As a rule, a faithful boy skilled in farm work can earn half his expenses on the Farm or in the Nursery. During the year he can ordinarily acquire sufficient skill in the wood or iron shops to enable him to make articles for sale. The whole question is one for his own consideration and decision. We can teach all who come, but cannot absolutely *promise* anything more. Hitherto we have refrained from holding out strong inducements respecting the amount of labor we might have to offer; but in view of the fact that during each of the last three years we have had more to do than the students could perform, we are inclined to give greater and positive encouragement on this point. Any boy who is in dead earnest, who is familiar with farm operations, and who can raise $50 to start with, should be able to carry himself through the four years' course. And certainly this places an education within the reach of every determined boy. As yet we are unable to offer similar advantages to girls, not requiring labor in the College departments which they can perform.

RULES.

1. Behave as a true man or woman should, at all times and in all places.

2. Attend to your own business promptly, thoroughly and courteously; and vigorously let alone that of other people.

3. Penalty: "Leave!"

PUBLICATIONS.

The "Hand-Book," published in 1874, containing a full discussion of the educational question and the aims of the Institution, will be forwarded to any one desiring it.

THE INDUSTRIALIST, a weekly journal edited by the Faculty and published by the Printing Department, contains original and seasonable articles on the Farm, Orchard, Trades, Sciences, and Education. Price, 75 cents a year. Address A. A. Stewart, Manhattan.

CALENDAR.

Fall Term, 1879.—Began Wednesday, September 10th, 1879, and will close December 18th, 1879.

TO NEW STUDENTS.

Bring the text-books you have been using. On arrival, first arrange for your boarding. A. A. Stewart will furnish information, either by letter or on application, concerning boarding places or rooms for rent. Report to the President at 8:30 A. M., immediately after chapel exercises, for enrollment.

For further information apply to M. L. Ward, President *pro tem*, Manhattan, Kansas.

LITERARY SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in the College Chapel every Friday at 2 P. M. Ladies admitted. New students cordially invited to attend. GEORGE ROSE, President.
MISS ROWENA WHALEY, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Telegraph Hall every Saturday evening. Visitors, especially students, always welcome.
NOBLE A. RICHARDSON, President.
GEORGE F. THOMPSON, Secretary.

RAILROAD TIME-TABLE.

KANSAS PACIFIC RAILWAY.

PASSENGER ARRIVES.

No. 2, going East	11:58 A. M.
No. 4, going East	3:28 A. M.
No. 1, going West	4:03 P. M.
No. 3, going West	4:51 A. M.
No. 7 (freight), going West	8:45 A. M.

Nos. 1, 2 and 7 run daily. No. 3 runs daily except Monday. No. 4 runs daily except Sunday. Passengers with tickets are carried on No. 7.

GEO. C. WILDER, Agent.

THE INDUSTRIALIST.

SATURDAY, OCTOBER 4, 1879.

Industrial Education.

The real value of an education to the student depends upon two things: First, the practical worth of the knowledge taught; and, second, the degree in which he makes it his own. Hence, the ability of any institution to give a practical education depends upon the kind and aim of the knowledge it teaches, and upon the thoroughness of the instruction therein. The State Agricultural College was directly endowed by Congress, and is guided by the State, for the specific purpose of furnishing to the industrial classes of Kansas a "practical" education, that is, "one fit for use." As its name indicates, and as the statistics of the industries of the State require, its chief work must be that of giving a useful and usable education to those who will engage in farming; and, therefore, the Farmer's Course must, from the nature of the case, be its main one.

FARMER'S EDUCATION.

Words and figures are merely instruments with which to record ideas. They are not themselves ideas, nor should they be made the chief end of an education. As a wagon is necessary to haul grain, so are they a necessary part of an education; but as the wagon is not the grain, so they are not the knowledge which the farmer converts into money. Hence, the classics and higher mathematics are not taught. But it will be noticed in the following course that so soon as the pupil acquires working skill in the use of the English language as a tool, and of figures and lines as mathematical tools, those arts and sciences which present knowledge that has a cash value to the farmer are taught as rapidly as their importance and thorough acquisition will permit. Studies numbered (1) and (4) in the second, third and fourth years are the spine of the course, to which the others are as ribs and muscle.

FARMER'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Practical Agriculture (advanced.)		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	
3. Polit'l Economy, Practical Law.		3. Practical Geometry.		3. Algebra.		3. Industrial Drawing.	
4. Zoology.		4. Horticul., Landscape Gardening.		4. Practical Agricul. (elementary).		4. English Structure.	
5. Agricul. Chemistry	Meteorology.	5. Organic, Analytical Chemistry.		5. Physics.		5. Adv'd Arithmetic, Book-keeping.	
6. Logic.		6. Practical Surveying.		6. Industrial Drawing.		6. U.S. History, Industrial Drawing.	

WOMAN'S EDUCATION.

Nearly one-half of our students are females, and the Woman's Course is prepared expressly for their liberal and practical education. We have no doubt whatever that practical men and women, who understand what it means and what it seeks to do, will fully endorse it.

WOMAN'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Farm Economy, Special Hygiene.		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	
3. Polit'l Economy, Practical Law.		3. Industrial Drawing.		3. Algebra.		3. Industrial Drawing.	
4. Zoology.		4. Horticul., Landscape Gardening.		4. English Literature.		4. English Structure.	
5. Phys'c'l Geography,	Meteorology.	5. Organic, Household Chemistry.		5. Physics.		5. Adv'd Arith., Book-keeping.	
6. Logic.		6. Household Economy.		6. Industrial Drawing.		6. U.S. History, Industrial Drawing.	

MECHANIC'S EDUCATION.

Because of the adaptedness of the leading course to the wants of the intelligent mechanic, it has been found practically unnecessary to diverge from the Farmer's Course. Additional studies, specially adapted to the mechanic's use, will be furnished in a Post-Graduate's Course.

If it be urged that the distinctively agricultural knowledge taught in the Farmer's Course is not directly valuable to the mechanic, we reply that, admitting the point for the purpose of argument, yet: 1. This knowledge is of more practical value to the mechanic than is the Latin, Greek, or a half dozen other things embraced in the usual course preparatory to the professions; 2. That the great majority of Kansas mechanics will also be more or less engaged in agriculture; 3. That those studies in the course which are directly valuable to the mechanic, together with the shop facilities, offer a better mechanic's education than can be elsewhere found west of the Alleghanies.

INDUSTRIAL DEPARTMENTS.

Having knowledge in the head is one thing; ability to use it with the tongue, fingers or feet is quite another thing. Both are vital to success in practical life. A man might thoroughly understand the theoretical principles of carpentry, and yet, not having used the tools, be wholly unable to earn carpenter's wages. So in all other vocations. Accordingly, instruction is given in the following well-equipped Industrial Departments, and every student is required to recite in some one of them, as selected by the pupil or parent:

FOR MALE STUDENTS.	FOR FEMALE STUDENTS.
The Farm.	Dress-making.
The Nursery.	Printing.
Carpentry.	Telegraphy.
Cabinet-making.	Scroll-sawing.
Turning.	Carving.
Wagon-making.	Engraving.
Painting.	Photography.
Blacksmithing.	Instrumental Music.

Each of these departments is conducted exactly as in daily life, and aims to give precisely the drill received by an apprentice. No charge is made, either for tuition or material, from male students taking the Industrials provided for them; nor from female students taking the ones provided for them, except in Instrumental Music. Male students taking either Printing or Telegraphy are charged $1.00 per month for the use of instruments and material.

DEPARTMENTS OF INSTRUCTION.

DEPARTMENT OF AGRICULTURE.

PRACTICAL AGRICULTURE.

Second Year:—General principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage.

Fourth Year: General view of agriculture, an cient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; genera advantages of a rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farmhouses; barns.

FARM ECONOMY.

Woman's Course, Fourth Year: Dairy products as human food; influences affecting character of milk; manufacture of condensed milk; the factory system and household plan of cheese-making; treatment of rennet; general process of cheese manufacture; subsequent t eatment of cheese; butter-making; creameries; "deep" and "shallow" setting systems; general process of butter-making; packing and preserving butter.

DEPARTMENT OF BOTANY AND PRACTICAL HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest; also a course of lectures on Landscape Gardening. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard; fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture; shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in in the work of laying out and plotting grounds topographically.

CHEMICAL DEPARTMENT.

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life. Text-book, Ganot.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blowpipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

Are constantly in progress in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

DRILL IN ENGLISH.

"As grammar was made after language, so ought it to be taught after language."—*Herbert Spencer.*

Drill in English embraces the following topics:

Sounds of the language; drill in producing the vocal, sub-vocal and aspirate elements with accuracy, distinctness and volume; vowels, consonants.

Letters: Form; power; rules for spelling, drill.

Words: Signification, properties, modifications, variations, relation and dependence.

Sentences: Drill in statement of ideas; description, clearness, terseness, vigor; business letters, discussion; capitalization; syllabication; punctuation; construction and analysis of sentences; elements, uses and names; criticism of compositions printed as written; proof reading; grammatical construction; superfluous words and clauses; drill in reading, speaking and penmanship.

Text-books: Webster's Academic Dictionary; Lee & Hadley's Advanced Lessons in Language.

Pupils deficient in spelling, etc., should enter the printing class, the printing-office being the work-shop of language.

STRUCTURE OF ENGLISH.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

MATHEMATICAL DEPARTMENT.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

DRILL IN ARITHMETIC.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Following this line, the student, so far from hammering away at "pure" science draws from the mathematical store-house what he needs, and sees why he needs it. Accuracy of calculation and posting, rather than a *mere* comprehension of the principles, is aimed at. Besides the recitation-room drill in business forms, practice in the field is also given. Estimating the number of cords in a pile of wood said to be 100x4x4 feet is one thing; measuring a pile of wood through which any number of cats may be harmlessly thrown, and in which four-feet sticks are the exception, is quite another and more difficult thing.

ARITHMETIC AND BOOK-KEEPING

Is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides ensuring arithmetical practice, develops practical skill in that important art.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admiral system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study. In addition, constant practice in the application of lines to metal and wood is furnished in the Blacksmith, Carpenter, Turning, Scroll-sawing, Carving, Engraving and Printing shops, and to fabrics in the Sewing Department.

PRACTICAL GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the use of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

PRACTICAL SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

STUDIES SPECIAL TO WOMAN.

Besides the studies already indicated, attention is called to the following:

SPECIAL HYGIENE.

As shown in the course, one term is devoted to the study of Physiology, from the text-book of Dr. J. C. Dalton. This is followed in the fourth year by a course of lectures to young ladies by Mrs. Cripps on the subject of Hygiene, embracing such instruction in hygienic matters as are valuable to woman.

FARM ECONOMY considers those affairs of the farm which usually come under the supervision of the farmer's wife or daughter, and which are not included in "gardening" or "household economy;" such as butter and cheese-making, dairy management, etc. A course of lectures is delivered by the Professor of Practical Agriculture. See heading, "Farm Economy."

GARDENING is included in Practical Horticulture. See heading, "Landscape Gardening."

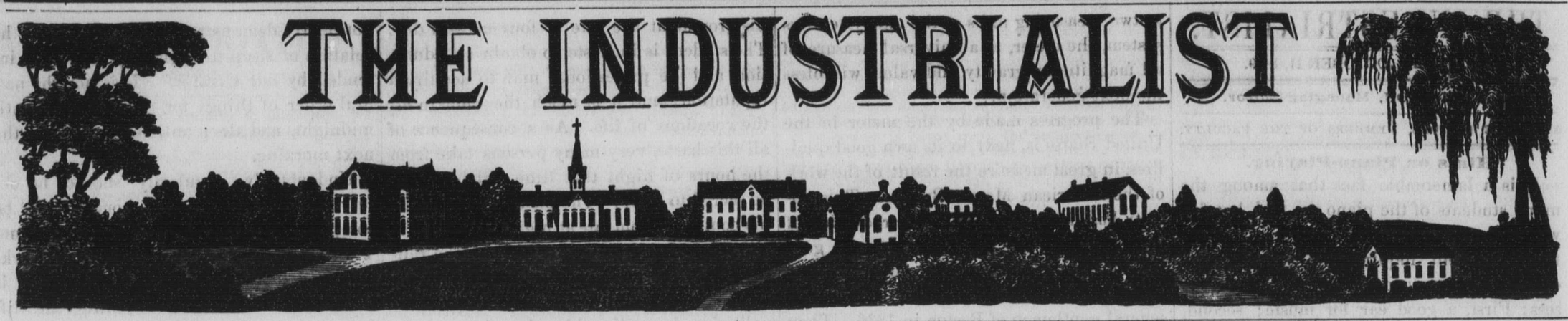
HOUSEHOLD CHEMISTRY. See heading, "Household Chemistry."

HOUSEHOLD ECONOMY

Follows Household Chemistry and consists of lectures by Mrs. Cripps on the art of house-keeping, embracing cookery, domestic management, and kindred topics. Many elderly gentlemen sufficiently know, and more young gentlemen will duly discover, that systematic knowledge of how cooking ought to be done is luminously different from the ability to do it. Instruction without practice can effect but little. Accordingly, a kitchen laboratory has been completely furnished, and affords every facility for drill in the art of cooking. This drill chiefly differs from that of a kitchen in the respect that after a girl has learned to wash dishes or pare potatoes she is not kept everlastingly at either. After full trial, we have found it just as feasible to give this practice, with profit and pleasure to the pupil, as it is to give laboratory practice in chemistry,—and no more expensive.

Printing!—Daily instruction and drill in the work of a First-Class Printer. The Literary Departments offer a thorough education in the construction and use of the English Language, as employed by the Proof-Reader; in Book-Keeping; and in Industrial Drawing, as the best developer of that taste necessarily exercised by every good Job Printer. The Printing Department is well furnished with all the facilities for a speedy mastery of the art of Printing, and is in charge of a practical printer. Besides regular class instruction in printing, the weekly publication of the INDUSTRIALIST by the Department furnishes advanced students the requisite drill in newspaper work.

THE INDUSTRIALIST



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Address A. A. STEWART, Manhattan, Kas.

Our Agricultural Colleges.

THE IDEAL.

In a brief notice of what our agricultural colleges ought to be, it may properly be assumed that they are to be: First, what the name college implies everywhere now, places of education for the young. Whatever service they may render in affording models for farming for the public, or in searching for new facts, principles or applications in agriculture, must be secondary. The education which they furnish must be agricultural, in quickening and deepening a young man's regard for a farmer's life, while in every way making him more capable in such a life. Learning and labor are to meet in a more profitable life upon the soil. With this understanding, it may be well to consider more specifically

THE AIMS.

Of these there are two classes, closely united: to develop the man in the farmer, and to develop farming through the man engaged in it. The first is to be sought in discipline, the genuine education, of youth. True scientific principles, which underlie all knowledge, are to be taught and enforced by a thorough drill in observation. The eyes must see and the hands handle the very elements of nature, in order to gain proper ideas of nature's use. There must be a definite training to think accurately and connectedly, and intensely if need be. Thinking has made the world's discoveries and inventions, and it will always be the means of progress in any calling. Thinking to a purpose will always distinguish the able man and the efficient work, and our college will have missed its aim if it fails to furnish thorough training to think. Added to this must be the formation of habits of ready action to a purpose. The thinking and the doing are so closely united in farming that no one can neglect training in both. Often the only expression of the thought is in the act that turns soil and seed, sunshine and shower, into produce. The college must aim at such a combination of thought and action in its routine of drill for developing the best men for the work of making farming better.

The second is to be sought through information. While this always accompanies discipline and directs the application of ability, it differs from that just as the instruction of a child how to drive a nail differs from the training which enables him to do it successfully. The college must gather and impart the best of instructions in the art of tilling the soil. It must gather from the history of this art, and from the failures and successes of practice and experiment, constantly such facts as will make the strongest impression. By such means it aims to give higher ideals and stronger ambition to do excellent work. It stimulates discussion and comparison of experiences, and encourages thoughtful consideration of future prospects. It aims to be a center of information for a farming community through its instructions to learners. So far as is compatible with thorough discipline and accurate information, it aims to be a leader in further improvement of practice by new devices, but cautiously preserves the difference between knowledge and supposition, fact and theory. Such aims suggest

THE METHODS.

Most prominent must stand a thorough course of study, long enough to establish principles and habits, severe enough to develop strength of mind, and so associated with agriculture as to cultivate enthusiasm for it. In this there must be systematic instruction by most approved methods in the sciences, training to logical investigation of facts and principles, history and general knowledge of civilization enough to kindle inquiry, and technical training enough to give a general ability.

This involves a drill in manual labor that shall make the hands ready and the eyes quick. That dexterity which comes from long practice in one routine is not desirable at this stage of education, if it were practicable; but a readiness to turn the hand to account in various directions is to be provided for by regular duty in real work, where pay and reputation and responsibility are thought of, and business rules apply, while a zest is given by connection with study and thought under competent oversight. These methods would bear a lengthy study, but we must hasten to connect with them

THE MEANS.

Among these we may place first a permanent endowment, sufficient to ensure the steady progress of the college through several generations. It should not be subject to the fluctuations of whims from parties or people, but should be an investment for posterity. "Art is long," and the work of education for the art of agriculture must be permanent, in order to be reached at all.

Ample equipment of buildings, furniture, and apparatus, farm and tools, is of course necessary. It must be even more ample than in most collges. Science, to be made practical, must be learned with laboratory practice; technical instruction is worthless without abundant illustration and exercise; and working habits can be formed only by handling the tools.

A competent faculty must handle this machinery. The drill of such a college calls for greater ingenuity, if not for more general culture, on the part of the faculty, than most college courses. This is not mere teaching, but teaching adjusted to a specific want in life. It calls for a practical energy in addition to sound doctrine, for it deals less with authorities than with facts. New applications of principles must keep them fresh in the life of toil which they are to elevate. The best in the land are none too good to hold the professorships in such a college, and should be found and kept, if possible.

Over all should preside an efficient and uniform control. The constitution of this board should be such as to secure greatest stability with activity. Love for the work must inspire the members, and provident foresight direct them. The whiffling of popular sentiment for pork or mutton, for Short-horns or Jerseys, must only make their course more steady and true to that line of education for farmers' sons which may give taste and ability for an enlightened and progressive agriculture.—*G. T. F., in Chicago Farmers' Review.*

Plow-Farming.

The farmer who devotes his time principally to the plow, that is, breaking up the land, raising grain, and other tilled, annual crops, such as require the constant use of the plow, harrow and hoe, will die a poor man,—particularly if he pursues this system steadily through a long series of years. There is no system so laborious as plow-farming. There is no other returns so small a profit.

Diversified farming is more interesting, more educating, refining, and more profitable, pecuniarily, than the drudgery of plow-farming. Variety in agriculture, as in every other department of life, is more interesting because less laborious and monotonous.

In order to keep the farm up to its highest productive capacity, as small an area should be in crops requiring the constant use of the plow and harrow, as is compatible with the greatest yield per acre and the allotted time to be devoted to the care of each crop. There should never be such an extent of any one crop as would trespass upon the time necessary to devote to others equally important in their season. Plowing too much land is the rock on which many industrious farmers are stranded. Other important work on the farm has to be neglected, the labor becomes excessive, and the burthens of the farmer and his family are simply an oppression which even a galley-slave should not be subject to. It is this mistaken practice which wears the life out of many a farmer, bringing on premature age, disgusting his sons, making a slave of his wife, and the whole life on the farm a mere existence without rest, recreation or enjoyment. To grow rich, to make money, is the declared object of these unnatural sacrifices; and yet no man ever grew rich by such a course, while it has impoverished thousands, and left them with exhausted lands, and rude, comfortless homes.

Where farm-work is a steady drag with the effort to cultivate more acres than the force under the control of the farmer can accomplish in season, and perform with thoroughness, the land is never made to do its best, and the returns are generally far from profitable. And when everything is staked on a single crop, failure is sure to be disastrously often.

A well-ordered farm and system of farming contemplates variety and diversified crops. Some will surely give good returns for the season's labor, and a steady income may be counted upon with much certainty. If the farm is largely seeded in tame grasses, the land will always remain productive when placed under the plow. Cattle, sheep and hogs should be part of the money crop, and good orchards should contribute to the farmer's income. His fowls are neglected, as a rule, and their profit merely nominal. The dairy product is half lost from a lack of knowledge in its management, and want of proper arrangements for preserving milk and cream and manufacturing the best quality of butter. No insignificant sum is expended annually for sweets, largely consisting of inferior molasses, and adulterated, unwholesome syrups, while scores of gallons of the purest and most wholesome go to waste on every farm for want of bees to gather and store it. The hard life and scanty remuneration of the farmer, so generally complained of, are largely attributable to the lack of ability to develop the full capacity of the farm. There are numerous branches in farming, all of which require a degree of special training to pursue with profit.

And again, few farmers have a well-defined system, that they pursue steadily, without permitting their plan to be changed by disappointment and partial failures. A well-matured plan of diversified farming, pursued steadily and intelligently for ten years, will never fail of achieving an average success which will satisfy reasonable expectations.—*Kansas Farmer.*

OUTSIDE of the settled and occupied States and Territories, there are over 724,000,000 acres of land belonging to the nation which have been already surveyed and are opened to settlement. There are also more than 1,000,000,000 acres yet to be surveyed.

IT don't pay to leave the work of mending your tools, and selecting and securing your seed, until the day you want to use them, thereby causing costly delay.

It don't pay to sow or plant poor seed because you happen to have it on hand. It don't pay to plant more ground than you can manure and take good care of. It don't pay to leave weak places in the fences in the hope that the cattle won't find them.

THE INDUSTRIALIST.

SATURDAY, OCTOBER 11, 1879.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

Hints on Piano-Playing.

It is a lamentable fact that among the many students of the piano we find but few who become really good players. Let us for a moment inquire into some of the causes. To be a good player one must possess: First, a good ear for music; second, perfect time; third, a knowledge of the notes, their names, subdivisions, etc.; and fourth, well-trained fingers. The first two qualifications nature only can give us: they cannot be acquired: they constitute what we call a talent for music. The others can be acquired by any one of ordinary ability. The last constitutes the mechanical part of piano-playing.

A number of would-be players lack natural talent, and should never undertake the study of music; for, besides the expense and the time devoted to practice, perhaps for years, it will all end in bitter disappointment. Among those possessing good, natural ability, there are many who do not succeed because sufficient attention has not been given to the correct training of their fingers. The teacher may have neglected this most important part of his duty; or, the pupil, finding the exercises dry and monotonous, hurries on to the practice of pieces which, requiring an execution beyond his present ability, he can never learn, instead of diligently practicing scales, exercises, and studies such as Kohler's, Czerny's and Plaidy's.

Pupils are too often allowed to learn a number of pieces, to the exclusion of more important studies, that they may make more of a display in the eyes of those who know little or nothing about music. Parents often flatter themselves that if their son or daughter plays a number of pieces in tolerably good time, and pounds a great deal of noise out of a piano, that they are fine musicians, when perhaps the missed and imperfectly-played notes could be counted by the hundred.

In studying music, be sure you commence at the beginning. Lay a solid foundation, and rate your progress, not from the quantity of pieces or pages, but from the quality of your performance. Take a regular course in some first-class Instruction Book, such as the N. E. Conservatory, Mason & Hamlin, or Richardson's Methods, and never pass a single page until it is thoroughly learned. Scales and exercises should be given at least one hour's practice a day. Hold the hands right, for with an incorrect position of the hand one can never acquire a good touch. Learn the meaning of all the different marks of expression, and observe them in your playing. Practice the different kinds of touch,—legato, staccato, wrist movement, etc. Do not undertake to learn pieces far beyond your ability: it will be only a waste of time. Lastly, do not expect to become a good player in a couple of months. It takes years of diligent practice to become a fine performer.—*Prof. Hofer.*

The Meter Among Us.

The INDUSTRIALIST has always been a strong advocate for the introduction of the decimal system of measurements; and, as "the car seems to move," we shall risk space for another article on this subject.

The meter is coming. It works its way slowly but steadily into our colleges, scientific societies, commercial *comptoirs*, and factories; and, by united offorts of all those disgusted with the one hundred and seventy-two measuring units of the old systemless system, the meter, as a universal measure of all magnitudes, gravity and value, will bless the next generation.

The progress made by the meter in the United States is, next to its own good qualities, in great measure the result of the work of the American Metric Bureau. This Society has done more for the introduction of the meter than any other agency,—the government not excepted. The idea of something of the kind took form in the minds of several gentlemen of Boston in 1876. They first thought to induce some business house to establish a metric department, and have furnished at reasonable prices everything needed for the teaching or actual use of the system. Arrangements were accordingly made with an enterprising school-book house to do something of the kind. Those interested were, however, greatly surprised to find that the public were prepared for much more vigorous introductory work than any business house could give without great sacrifice. The people could be rapidly educated to see the advantages of the new system only by the combined and well-organized effort of those enough interested to give their co-operation.

The first plan was, therefore, abandoned; and, after due consideration of various ideas, it was decided to incorporate a body under the law for missionary societies for educational and scientific purposes. On July 26th, 1876, this Society was organized under the name, "American Metric Bureau." Its members, now numbering several hundred, are public-spirited and energetic gentlemen from all parts of the United States; and the Society has exerted an influence unpredicted by the most enthusiastic at the time of its birth. Though all expenses must be raised by soliciting voluntary contributions, the Bureau has, since its organization, distributed thousands of tracts, metric charts, metric measuring units, and publications speaking of the advantages of the meter. It has established branch offices in most States of the Union, and is publishing a monthly periodical, the "*Metric Bulletin*," at the central office, Hawley St., Boston. Space does not permit us to say more of the Bureau or the *Bulletin*, but we will gladly give information at our command to any party interested.

The latest publication by the Bureau is a new edition of the standard work on this subject, by its President, F. A. P. Barnard, of Columbia College, New York, which has heretofore been published in New York at $3.00 per copy. This new edition contains three times the matter of the old; and has been made the most complete work in the language, its index of 2,000 references making it really a metric cyclopedia. The Society wishes to scatter it widely through the country as the best means of giving accurate information about the metric weights and measures, of which so much has been ignorantly written. They offer it at $1.50, one-half the rate charged for the original book. It may be added here that President Barnard has not only given the great labor involved in compiling the work, but has also contributed nearly $1,000 toward the necessary expenses of its distribution.—*Prof. Walters.*

Sleep.

This is a driving age. Everybody is in a hurry. Since men have learned to travel at the rate of a mile in a minute or two, and to converse with others at a distance with electric speed, they seem to desire to do everything else in haste. Boys are in a hurry to become men. Men are in a hurry to become rich. The farmer wants to plow his ground at the rate of four acres a day. The student is in haste to obtain an education, and the professional man to acquire a reputation; and it is much the same in all the vocations of life. As a consequence of all this haste, very many persons take from the hours of night that time which should be sacred to sleep. The business man is in his counting-room late at night; and in traveling, he takes the night trains on the railroad in order to save time, thus depriving his body of needful rest and sleep. The politician is pulling his wires beyond the midnight hour; and we often read of all-night sessions of our Legislature and Congress. The student and the professional man consume the midnight oil in poring over their books, and in preparing their addresses. Besides this business hurry, many of the customs of society and of the lovers of pleasure trespass upon the hours of sleep. Parties of young people are held until a late hour of the night; and even at church socials a supper is sometimes given at ten or twelve o'clock P. M., when every sensible person knows that a hearty meal of rich and indigestible food, eaten at that hour, spoils the whole night for good, solid repose, besides all the other evils to the digestive organs that follow in their train. The ball-room proverbially echoes to the tread of nimble feet, e'en through the wee, small morning hours; while nearly the same may be said of the billiard saloon and the gambling house. As a natural result of all this hurry, and violation of the laws of repose and natural recuperation, in connection with violations of other physical laws, we are developing a weak, nervous race of people. We are causing the insane asylums of our land to overflow their utmost capacity. Where is the State in our Union that has an insane asylum large enough to accommodate its natural inmates? We read and hear of a large number of suicides, which is allowed to be one of the forms of insanity.

Our people are subject to a thousand and one nervous diseases, shortening their lives and destroying their usefulness. That disease so prevalent among us, called the blues, may often be attributed to some violation of the law of repose. How few of the men and women of our day can stand up and say, "I am really well. My physical functions are all in as vigorous operation as they should be."

Now, while it is true that the laws of sleep may be violated, even for a series of years, without apparently receiving any penalty, yet the penalty is sure to follow; "and because sentence against an evil work is not executed speedily, therefore the heart of the sons of men is fully set in them to do evil." Many persons in middle and later life suffer severely for the sins of their youth.

It is very certain that sleep was intended as the great invigorator and restorer of the wasted powers of body and brain; and if we cut short the time necessary for this, it is but drawing drafts which must be met in the future; and when I hear such mathematical questions as, How much time will a man save in forty years by rising thirty minutes earlier each morning? I think of the possibility that what he saves in the early part of life, he may lose with compound interest in the latter part.

How much sleep is necessary to properly recuperate the body? This may be a problem not exactly easy of solution, and the answer would not, probably, be the same for all persons; but, as an average, one-third of our whole time should be spent in sleep. Just what part of the twenty-four hours in a day is the best adapted for this purpose is not clearly demonstrated, but evidently "the relation of sleep to night was expressly intended by our Creator." It is not the natural order of things for one to work until midnight, and sleep until eight o'clock the next morning.

Undoubtedly, regularity should be observed, and naturally eight hours should be completed at or before the rising of the sun. The idea that students and other brain workers need less sleep than hand workers, is certainly fallacious. If anything, the difference is on the other side; and I would warn every student, teacher, or other professional man who thinks four, five or six hours is long enough to lie in bed, that he is drawing heavy drafts upon the future which must be met, and that perhaps in no agreeable manner.—*Prof. Platt.*

THE INDUSTRIALIST.

SATURDAY, OCTOBER 11, 1879.

Instead of the usual circular or catalogue, we send the Industrialist to those desiring information about the Kansas State Agricultural College. We would call attention to the articles headed "Departments of Instruction," "Industrial Education," "Special Advantages," and "Directions to Applicants." If further information is desired, address Agricultural College, Manhattan, Kansas.

The quarterly meeting of the Board of Regents occurs on Tuesday, October 14th.

During the week a handsome Essex boar pig was received from J. A. Patten, Hennepin, Ill.

Frank H. Hulse, a student at the Emporia Normal in 1877, now attends the Agricultural College.

The rain-fall for the week past is .35 of an inch. The weather has been quite warm, with a large per cent of cloudiness.

Two hundred and four students have been enrolled so far this term, and very nearly two hundred of these are now on the grounds.

The exchanges of the INDUSTRIALIST are on file in the Library room, and a few other papers are furnished by different members of the Faculty.

Prof. Popenoe has rented the new house which is being erected just east of Mr. Peckham's, and will thereby be enabled to bring his family here in a few weeks.

The subscription price of the INDUSTRIALIST is only seventy-five cents per year. This hint may be safely appropriated by a large number of delinquent subscribers.

The able article on our first page, entitled "Our Agricultural Colleges," is from the pen of President Fairchild. It should receive the attention of all the friends of agricultural education.

The Library of the College is open from eight o'clock to one o'clock on every school-day. This gives an opportunity for students to exchange books, or to consult cyclopedias and other books of reference.

By the courtesy of Secretary Shelden, the class in Practical Agriculture made the tour of the fair-grounds on Thursday. The magnificent herds of stock on exhibition furnished many valuable hints and suggestions in the art of breeding.

During the Fair crowds of visitors thronged the halls and recitation rooms of the College. We have not space to publish all their names, but would hereby acknowledge their attentions, and thank them for the encouraging words they all expressed.

Four years ago the College herd, with perhaps a half-dozen other pure-bred cattle, made the total exhibit of pure-bred stock at the Riley County Fair. This year over sixty head were on exhibition, including Short-horns, Herefords, Galloways and Jerseys.

The following school bonds have recently been purchased by the Agricultural College: Bonds of Dist. No. 80, Dickinson Co., $2,000; of No. 71, Barton Co., $350; of No 11, Republic Co., $400; of 32, Republic Co., $250; of No. 65, Republic Co., $300. Total, $3,300.

Miss Sallie Hutsell instructs us to send her INDUSTRIALIST to Galena, Cherokee county, instead of Brownsville. She is teaching school in Galena this year. Last year Miss Hutsell was one of our best students, and we are pleased to know that she is appreciated in her county.

New students have been enrolled this week as follows: *Linn county*—Oscar F. Pierce; *Shawnee*—Robert S. Baxter; *Ottawa*—Henry Nelson; *Missouri*—Mary J. Fisher; *Clay*—J. M. Wylie and R. J. Wylie; *Riley*—Ezra S. Clarke; *Elk*—Frank H. Hulse; *Johnson*—Minnie Millikan.

Among the many visitors at the College this past week were the venerable Dr. Reynolds, wife and two daughters, of Fort Riley. The good Doctor was for a long time a Regent of this College, and still has a deep interest in its welfare. He was delighted with the appearance of the new building, and expressed himself as sure that the next Legislature would provide means to complete the main building, and thus furnish accommodations to the rapidly-increasing number of students.

The last INDUSTRIALIST was an unusually bright number. Your criticism on the use of "agreeably disappointed" so stired up the editor that he displayed a latent power of which the world never dreamed.—*Nationalist.*

It will be seen by the above that the *Nationalist* is not content with demolishing the dictionary, but this week makes (we wish we could say commences) a most foul attack upon the spelling-book. Try the primer and alphabet next.

Yes, "stired" was just how we felt!

Webster Society met in Telegraph Hall last Saturday evening. The question of great wealth *vs.* great fame was ably discussed, but in the end the American's proverbial love for the "almighty dollar" conquered, and hereafter Tilden's "bar'l" must needs be held in reverence. Under extemporaneous speaking many important questions, such as Grant, Democracy, "black horses," etc., were discussed, and many anecdotes were related,—a new feature in the Society. The Society was honored by the presence of about a dozen young ladies, one of whom remarked that even the miserable ostracised Websters could now be visited by ladies without annoyance or insult,—a promising symptom. Question for next evening, "*Resolved*, That America has produced smarter men in the last century than any other nation." Our "Leach" has arrived: come out and see him.

WOOD.

Notwithstanding the Fair and the gloomy forebodings of the weather, a goodly number of Alpha Betas were loyal to their "colors," and assembled in the chapel at the regular hour on Oct. 10th. Extemporaneous speaking, which preceded debate, was lively and entertaining. Various subjects of interest were discussed. Among them it was decided that this College is not advantageous to the professional mechanic, because each student taking carpentry becomes his own mechanic, and therefore the professional mechanic loses patronage. Extemporaneous speaking was followed by an essay on "Archery," by W. J. Jeffery. Declamation and select reading were omitted. The debate, as the last order of business, showed careful thought and preparation on the part of the speakers, and the question was intelligently discussed. The judges finally decided that newspapers have done more good than railroads.

The question for debate next week is, "*Resolved*, That Queen Elizabeth had more influence in England than Queen Mary." Affirmative, Messrs. Coleman and Walters; negative, Messrs. Hopper and Jeffery. The *Gleaner* will be presented by Mr. J. W. Chenoweth and Miss Clarke. We wish every one, especially new students, to consider that as Alpha Betas we are hospitable by nature, and always wish visitors to feel at home within our walls.

M. E. S.

NATIONALIST ITEMS.

Johnny Winne is up again, after quite a severe sickness.

Balderston now runs his bread wagon to College Hill twice a week.

Geo. Denison, now living in Colorado, has been visiting Hon. I. T. Goodnow lately.

Mr. Hawkes, superintendent of the mechanical department at the College, has moved into the first house west of the Baptist Church.

Quite a large company of the friends of Dr. Phelps assembled at his residence Tuesday afternoon, Oct. 7th, to congratulate and celebrate with him his 84th birthday.

Dr. Patee intends to erect a hotel on the southeast corner of Poyntz avenue and first street. It will be 50x105 feet, two stories high, with a mansard roof, and will be built of brick and stone. He expects to commence work next February.

On Monday last Dr. Patee extracted a pea from the ear of a fifteen-year-old daughter of Mr. Wythe, the master mechanic of the K. P. at Ellis. It had been in the ear two years last April, and several futile attempts had been made to remove it. E. K. Shaw, of this place, made the silver instrument with which the work was done.

Mr. Grandison Fairchild is the father of three college presidents, viz., Oberlin, Berea, and Kansas State Agricultural. One of his sons-in-law is a professor in the Michigan Agricultural College, and at least eight or nine of the grandsons and grandsons-in-law are also college professors.—*Capital.*

It is impossible for man to be perfectly satisfied with everything that occurs. We see actions every day that we don't like, but we are particularly pleased with the action of the Republican County Convention in placing in nomination our estimable friend, Mr. A. N. Godfrey, of Madison township, as candidate for County Surveyor. He is not only an energetic, amiable gentleman; but his natural ability and thorough practical education eminently qualifiy him for the position. Mr. Godfrey has lived in Kansas since he was four years of age. He attended the State Agricultural College, graduating in the class of '78. He is a very worthy young man, and will doubtless receive the support of the voters of Greenwood county at the coming election.—*Madison News.*

DIRECTIONS TO APPLICANTS.

TERMS OF ADMISSION.

Candidates for admission must be fourteen years of age, and pass a satisfactory examination in reading; arithmetic, through decimal fractions; and English grammar, to syntax. Classes are started at the beginning of each year in Drill in Arithmetic and Drill in English; and the pupil must have the knowledge above indicated, else he will be unable to retain position if admitted.

Pupils will be received at any time during the year, if able to pass an additional examination upon the subjects studied by the classes which they expect to enter. But they will find it greatly to their advantage to be present at the opening of each term, or as soon thereafter as posssble.

GRADES.

Both the Literary and Industrial recitations are graded daily upon a scale of 100; and an examination of all classes is made at the close of each month. A student not attaining an average grade of sixty is promptly dropped to a lower class, or excluded from the Institution until able to do so. The work of grading is strict and uniform in all the departments, and this process is rigorously used for sifting out incompetent and indolent pupils; thus more than accomplishing all that is designed to be effected by a "high standard of admission." Hence, the student's continuance in the College wholly depends upon his own action.

The course is based upon the determination to make the labor required in the preparation of one industrial and three literary recitations as much as the average student can perfectly perform, in ten hours a day. We design to give the pupil the worth of the time expended at College; and, in order thereto, he must do a full day's work with brain or hand. Only those students who can maintain a standing of ninety in each study will be allowed to take more than the prescribed number of recitations; and no one will be permitted to have less than one industrial and three literary recitations.

RELIGIOUS.

Unless otherwise directed by parents, students are required to attend chapel at 8:30 A. M. on academic days, and divine service once every Sabbath.

EXPENSES.

There are no charges whatever for enrollment, attendance or instruction in the regular courses; nor are there any "contingent fees" for the repair of buildings, for the use of books or apparatus, for diplomas, or the kindred privileges usually grouped under the term "contingent." Male students are furnished instruction, the use of apparatus, instruments or tools, in both the literary and industrial classes marked out for them, without any charge. And the same is true of female students in the regular classes provided for them. Printing and Telegraphy are industrials primarily provided for the education of female students, and male students taking either of these are charged $1 per month for use of instruments.

Instrumental music is a fine art or "accomplishment," rather than a mechanical art. We do not place it among our "industrials" in the same sense, or for the same purpose, that we do those provided for teaching the trades. Accordingly, the following fee is required from female students for tuition and the use of instruments:

Terms per week:

Private lessons, 2 a week, on any instrument, $1.00
Private lessons, 1 a week, on any instrument, .60
Class lessons, 2 a week, on any instrument, .65

Instruction in harmony, etc., etc., from ten to fifty cents per week, as the student may or may not be in other classes.

The only charge made for material in either the literary or industrial departments is for the chemicals used by students in laboratory practice, which are furnished at wholesale prices, and amount to but a small sum.

Furnishing an absolutely free education is as much as can be reasonably asked; and the Institution neither boards, clothes, nor supplies the student with text-books. Boarding can be obtained in private families at from $2.75 to $4 per week. Washing costs from seventy-five cents to one dollar per dozen. Text-books, which can be procured in Manhattan, cost from $2 to $5 per term.

No student need expend over $5 per week; and many of our best pupils are living at $1.25 per week. Students desiring to "board themselves" can do so at from $1 to $2 per week. In a club of four young men, renting a house, the average cost to each for the term was $1.11 per week.

LABOR.

Manual labor by the students may be for either of two purposes: First, to acquire skill in a given art; second, to earn money. In the first case, the labor is educational; in the second, it should be paid for by the party benefited.

Educational Labor.—Manual labor in the recitations of the Industrial Departments, like mental labor in those of the Literary Departments, is purely educational and will not be remunerated. While the interest of the student will be held paramount in the direction of this labor, the practice necessary to dexterity will be required.

Remunerated Labor.—When the Institution needs labor on the Farm or elsewhere which is not educational, but simply for its own profit, and which a student is able and willing to perform, it becomes an employer instead of a teacher, and he an employe instead of a scholar. It pays for work, he works for pay. The relation between them is commercial, not educational; and both parties must act upon business principles. Hence, the College furnishes only such employment as its own interests require, and will pay according to the value of the service rendered at from seven to ten cents an hour.

AMOUNT EARNED.

It is impossible to predict how much a given person can earn, since that depends upon what he can do and what work there is to be done. Hence, it is wholly impossible for us to answer the question so often asked: "Do you think I can meet my expenses by work?" Some students make one-half their expenses, some the whole, and exceptional men have made more than expenses. As a rule, a faithful boy skilled in farm work can earn half his expenses on the Farm or in the Nursery. During the year he can ordinarily acquire sufficient skill in the wood or iron shops to enable him to make articles for sale. The whole question is one for his own consideration and decision. We can teach all who come, but cannot absolutely *promise* anything more. Hitherto we have refrained from holding out strong inducements respecting the amount of labor we might have to offer; but in view of the fact that during each of the last three years we have had more to do than the students could perform, we are inclined to give greater and positive encouragement on this point. Any boy who is in dead earnest, who is familiar with farm operations, and who can raise $50 to start with, should be able to carry himself through the four years' course. And certainly this places an education within the reach of every determined boy. As yet we are unable to offer similar advantages to girls, not requiring labor in the College departments which they can perform.

RULES.

1. Behave as a true man or woman should, at all times and in all places.

2. Attend to your own business promptly, thoroughly and courteously; and vigorously let alone that of other people.

3. Penalty: "Leave!"

PUBLICATIONS.

The "Hand-Book," published in 1874, containing a full discussion of the educational question and the aims of the Institution, will be forwarded to any one desiring it.

THE INDUSTRIALIST, a weekly journal edited by the Faculty and published by the Printing Department, contains original and seasonable articles on the Farm, Orchard, Trades, Sciences, and Education. Price, 75 cents a year. Address A. A. Stewart, Manhattan.

CALENDAR.

Fall Term, 1879.—Began Wednesday, September 10th, 1879, and will close December 18th, 1879.

TO NEW STUDENTS.

Bring the text-books you have been using. On arrival, first arrange for your boarding. A. A. Stewart will furnish information, either by letter or on application, concerning boarding places or rooms for rent. Report to the President at 8:30 A. M., immediately after chapel exercises, for enrollment.

For further information apply to M. L. Ward, President *pro tem*, Manhattan, Kansas.

LITERARY SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in the College Chapel every Friday at 2 P. M. Ladies admitted. New students cordially invited to attend. GEORGE ROSE, President.
MISS ROWENA WHALEY, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Telegraph Hall every Saturday evening. Visitors, especially students, always welcome.
NOBLE A. RICHARDSON, President.
GEORGE F. THOMPSON, Secretary.

RAILROAD TIME-TABLE.

KANSAS PACIFIC RAILWAY.

PASSENGER ARRIVES.

No. 2, going East..... 11:58 A. M.
No. 4, going East..... 3:28 A. M.
No. 1, going West..... 4:03 P. M.
No. 3, going West..... 4:51 A. M.
No. 7 (freight), going West..... 8:45 A. M.

Nos. 1, 2 and 7 run daily. No. 3 runs daily except Monday. No. 4 runs daily except Sunday. Passengers with tickets are carried on No. 7.

GEO. C. WILDER, Agent.

THE INDUSTRIALIST.

SATURDAY, OCTOBER 11, 1879.

Industrial Education.

The real value of an education to the student depends upon two things: First, the practical worth of the knowledge taught; and, second, the degree in which he makes it his own. Hence, the ability of any institution to give a practical education depends upon the kind and aim of the knowledge it teaches, and upon the thoroughness of the instruction therein. The State Agricultural College was directly endowed by Congress, and is guided by the State, for the specific purpose of furnishing to the industrial classes of Kansas a "practical" education, that is, "one fit for use." As its name indicates, and as the statistics of the industries of the State require, its chief work must be that of giving a useful and usable education to those who will engage in farming; and, therefore, the Farmer's Course must, from the nature of the case, be its main one.

FARMER'S EDUCATION.

Words and figures are merely instruments with which to record ideas. They are not themselves ideas, nor should they be made the chief end of an education. As a wagon is necessary to haul grain, so are they a necessary part of an education; but as the wagon is not the grain, so they are not the knowledge which the farmer converts into money. Hence, the classics and higher mathematics are not taught. But it will be noticed in the following course that so soon as the pupil acquires working skill in the use of the English language as a tool, and of figures and lines as mathematical tools, those arts and sciences which present knowledge that has a cash value to the farmer are taught as rapidly as their importance and thorough acquisition will permit. Studies numbered (1) and (4) in the second, third and fourth years are the spine of the course, to which the others are as ribs and muscle.

FARMER'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Practical Agriculture (advanced.)		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	
3. Polit. Economy, Practical Law.		3. Practical Geometry.		3. Algebra.		3. Industrial Drawing.	
4. Zoology.		4. Horticul., Landscape Gardening.		4. Practical Agricul. (elementary).		4. English Structure.	
5. Agricul. Chemistry	Meteorology.	5. Organic, Household Chemistry.		5. Physics.		5. Adv'd Arithmetic, Book-keeping.	
6. Logic.		6. Practical Surveying.		6. Industrial Drawing.		6. U.S. History, Industrial Drawing.	

WOMAN'S EDUCATION.

Nearly one-half of our students are females, and the Woman's Course is prepared expressly for their liberal and practical education. We have no doubt whatever that practical men and women, who understand what it means and what it seeks to do, will fully endorse it.

WOMAN'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Farm Economy, Special Hygiene.		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	
3. Polit'l Economy, Practical Law.		3. Industrial Drawing.		3. Algebra.		3. Industrial Drawing.	
4. Zoology.		4. Horticul., Landscape Gardening.		4. English Literature.		4. English Structure.	
5. Phys'l Geography, Meteorology.		5. Organic, Household Chemistry.		5. Physics.		5. Adv'd Arith., Book-keeping.	
6. Logic.		6. Household Economy.		6. Industrial Drawing.		6. U.S. History, Industrial Drawing.	

MECHANIC'S EDUCATION.

Because of the adaptedness of the leading course to the wants of the intelligent mechanic, it has been found practically unnecessary to diverge from the Farmer's Course. Additional studies, specially adapted to the mechanic's use, will be furnished in a Post-Graduate's Course.

If it be urged that the distinctively agricultural knowledge taught in the Farmer's Course is not directly valuable to the mechanic, we reply that, admitting the point for the purpose of argument, yet: 1. This knowledge is of more practical value to the mechanic than is the Latin, Greek, or a half dozen other things embraced in the usual course preparatory to the professions; 2. That the great majority of Kansas mechanics will also be more or less engaged in agriculture; 3. That those studies in the course which are directly valuable to the mechanic, together with the shop facilities, offer a better mechanic's education than can be elsewhere found west of the Alleghanies.

INDUSTRIAL DEPARTMENTS.

Having knowledge in the head is one thing; ability to use it with the tongue, fingers or feet is quite another thing. Both are vital to success in practical life. A man might thoroughly understand the theoretical principles of carpentry, and yet, not having used the tools, be wholly unable to earn carpenter's wages. So in all other vocations. Accordingly, instruction is given in the following well-equipped Industrial Departments, and every student is required to recite in some one of them, as selected by the pupil or parent:

FOR MALE STUDENTS.	FOR FEMALE STUDENTS.
The Farm.	Dress-making.
The Nursery.	Printing.
Carpentry.	Telegraphy.
Cabinet-making.	Scroll-sawing.
Turning.	Carving.
Wagon-making.	Engraving.
Painting.	Photography.
Blacksmithing.	Instrumental Music.

Each of these departments is conducted exactly as in daily life, and aims to give precisely the drill received by an apprentice. No charge is made, either for tuition or material, from male students taking the Industrials provided for them; nor from female students taking the ones provided for them, except in Instrumental Music. Male students taking either Printing or Telegraphy are charged $1.00 per month for the use of instruments and material.

DEPARTMENTS OF INSTRUCTION.

DEPARTMENT OF AGRICULTURE.

PRACTICAL AGRICULTURE.

Second Year:—General principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage.

Fourth Year: General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of a rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farm-houses; barns.

FARM ECONOMY.

Woman's Course, Fourth Year: Dairy products as human food; influences affecting character of milk; manufacture of condensed milk; the factory system and household plan of cheese-making; treatment of rennet; general process of cheese manufacture; subsequent treatment of cheese; butter-making; creameries; "deep" and "shallow" setting systems; general process of butter-making; packing and preserving butter.

DEPARTMENT OF BOTANY AND PRACTICAL HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest; also a course of lectures on Landscape Gardening. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard; fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture; shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in in the work of laying out and plotting grounds topographically.

CHEMICAL DEPARTMENT.

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life. Text-book, Ganot.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

METEOROLOGY.

Embracing the composition of the atmosphere atmospheric pressure; temperature and humidity laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blowpipe analysis forms a very important part of the ourse, each student being required to name and dentify a large series of minerals. Text-book, Dana's Mineralogy.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

Are constantly in progress in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

DRILL IN ENGLISH.

"As grammar was made after language, so ought it to be taught after language."—*Herbert Spencer.*

Drill in English embraces the following topics:

Sounds of the language; drill in producing the vocal, sub-vocal and aspirate elements with accuracy, distinctness and volume; vowels, consonants.

Letters: Form; power; rules for spelling, drill.

Words: Signification, properties, modifications, variations, relation and dependence.

Sentences: Drill in statement of ideas; description, clearness, terseness, vigor; business letters, discussion; capitalization; syllabication; punctuation; construction and analysis of sentences; elements, uses and names; criticism of compositions printed as written; proof reading; grammatical construction; superfluous words and clauses; drill in reading, speaking and penmanship.

Text-books: Webster's Academic Dictionary; Lee & Hadley's Advanced Lessons in Language.

Pupils deficient in spelling, etc., should enter the printing class, the printing-office being the work-shop of language.

STRUCTURE OF ENGLISH.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

MATHEMATICAL DEPARTMENT.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

DRILL IN ARITHMETIC.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Following this line, the student, so far from hammering away at "pure" science draws from the mathematical store-house what he needs, and sees why he needs it. Accuracy of calculation and posting, rather than a *mere* comprehension of the principles, is aimed at. Besides the recitation-room drill in business forms, practice in the field is also given. Estimating the number of cords in a pile of wood said to be 100x4x4 feet is one thing; measuring a pile of wood through which any number of cats may be harmlessly thrown, and in which four-feet sticks are the exception, is quite another and more difficult thing.

ARITHMETIC AND BOOK-KEEPING

Is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides ensuring arithmetical practice, develops practical skill in that important art.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admiral system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study. In addition, constant practice in the application of lines to metal and wood is furnished in the Blacksmith, Carpenter, Turning, Scroll-sawing, Carving, Engraving and Printing shops, and to fabrics in the Sewing Department.

PRACTICAL GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the use of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

PRACTICAL SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

STUDIES SPECIAL TO WOMAN.

Besides the studies already indicated, attention is called to the following:

SPECIAL HYGIENE.

As shown in the course, one term is devoted to the study of Physiology, from the text-book of Dr. J. C. Dalton. This is followed in the fourth year by a course of lectures to young ladies by Mrs. Cripps on the subject of Hygiene, embracing such instruction in hygienic matters as are valuable to woman.

FARM ECONOMY considers those affairs of the farm which usually come under the supervision of the farmer's wife or daughter, and which are not included in "gardening" or "household economy;" such as butter and cheese-making, dairy management, etc. A course of lectures is delivered by the Professor of Practical Agriculture. See heading, "Farm Economy."

GARDENING is included in Practical Horticulture. See heading, "Landscape Gardening."

HOUSEHOLD CHEMISTRY. See heading, "Household Chemistry."

HOUSEHOLD ECONOMY

Follows Household Chemistry and consists of lectures by Mrs. Cripps on the art of house-keeping, embracing cookery, domestic management, and kindred topics. Many elderly gentlemen sufficiently know, and more young gentlemen will duly discover, that systematic knowledge of how cooking ought to be done is luminously different from the ability to do it. Instruction without practice can effect but little. Accordingly, a kitchen laboratory has been completely furnished, and affords every facility for drill in the art of cooking. This drill chiefly differs from that of a kitchen in the respect that after a girl has learned to wash dishes or pare potatoes she is not kept everlastingly at either. After full trial, we have found it just as feasible to give this practice, with profit and pleasure to the pupil, as it is to give laboratory practice in chemistry,—and no more expensive.

Printing!—Daily instruction and drill in the work of a First-Class Printer. The Literary Departments offer a thorough education in the construction and use of the English Language, as employed by the Proof-Reader; in Book-Keeping, and in Industrial Drawing, as the best developer of that taste necessarily exercised by every good Job Printer. The Printing Department is well furnished with all the facilities for a speedy mastery of the art of Printing, and is in charge of a practical printer. Besides regular class instruction in printing, the weekly publication of the INDUSTRIALIST by the Department furnishes advanced students the requisite drill in newspaper work.

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Science and the Industrial Arts in Education.

BY PRESIDENT GEO. T. FAIRCHILD.

[Delivered at Charlotte and Flint Institutes.]

The subject of education is no longer new; and yet it can never be old. The grand problem of civilization, in all its intricacies of human weal, reduces at last to the problem of education. What can be done for a community, the nation, or the race, is limited by the capacity of its individual members; and this capacity is the direct result of education. The growth of all the ages past is to our advantage, only as our training fits us to accept its results and push forward.

Is it strange then that such a universal problem should have to be solved again and again, as each generation comes to get and to give its share of the world's good? Or is it strange that so vital a matter to all interests should be the pet of theorizers, those universal geniuses who seek a panacea for all evils? Quackery is by no means confined to one profession. Every good work has gained a ridiculous side from some of its hobby-riders, and popular education has not suffered least from such one-sided views. But the more we know of each other's experience and thought the less of mischief will be done by any new experiment; so we may rightly venture to discuss the modern forms of the same old questions. The fact that "doctors disagree" has not kept the world from actual progress in combating disease, nor need it keep us from success in the combat of learning with ignorance, of efficiency with helplessness.

The aim, I suppose, of every system of education in any age, is efficiency in all that pertains to genuine manhood. The essential principles of developement in our common human nature, too, must ever remain the same. A general view of this aim and these principles, as well as some suggestions as to methods, I had the pleasure of presenting on a similar occasion one year ago, under the theme, "A Practical Education." These principles can never be lost sight of; and yet their principal application at every step must vary with each change of circumstances. A half century ago, when "Uncle Sam was rich enough to give us all a farm," everybody was satisfied that, with free schools well supported, our social, commercial and national prosperity was secured. There was little question then as to scope and methods. A quarter of a century since, when cities had begun to hide their thousands of tradesmen and mechanics and menials from the healthy outer life, and all through our eastern borders, factory and farm were beginning to crowd each other, the problem of social prosperity, at least, assumed a new phase; and the world asked if our schools had kept pace with our wants in the kind of knowledge taught. Then came the educational war of science with the classics, the noise of whose combats still echoes occasionally from the remoter outskirts of the field, although the main question is happily settled by a harmonious blending of the two in college curriculum and school classification.

Now, when extreme division of labor has cramped the powers of body and mind among a crowded city population; when invention has been stimulated to a waste of intelligence, energy and wealth in almost every employment; when a generous trade, through excessive speculation, has degenerated into greed; when wit is thought to afford a shorter road to wealth than work offers; when the wants of the masses outrun their ability to meet them in spite of our education,—it is natural and proper that we should have a new questioning of our means of culture.

Have we not, of late, fostered learning before ability, and so encouraged mere curious speculation rather than practical talent? Have not our tests of scholarship by examination been too much a trial of capacity for acquiring memorized facts, and too little proof of thorough understanding of foundation principles of science and literature? Why do we all laugh with a wink of earnestness at the newspaper story about the boy's perfect readiness to give correctly for twenty-five cents the capital cities of Europe, and his equally ready answer to whether they are animal or vegetable? Is there not a quite general feeling that the youth in our public schools know too much and do too little? Who can answer effectively the current complaints from newspaper and platform that our highest education is compatible with a poetical idiocy? These are questions which crowd upon school boards and into State teachers' associations. They are only partially answered to most men by the fact that a college education multiplies by fifty the chances of promotion to offices of trust and authority, and brings into active life at least ten years earlier. Our assertion that these educated idiots, as they are called, are the exceptions is met with a "may be so," or at least with a look of doubt.

We cannot wonder, then, if there appears a disposition to experiment in some new process, or some new adjustment of old methods. Usually, as in most other reforms, the first effort is to reach an extreme in opposition to what is pronounced a failure. So at this time we find a class of earnest men, convinced of the inefficiency of our schools, rushing to the conclusion that, not science, not literature, but industrial arts are the subjects to be taught. Since a comfortable living is the first requisite of happiness, should we not secure first that training in skill which may secure ability to earn such a living? Since the industrial arts must ever be the foundation of material wealth, and so of all prosperity, are not these the solid basis of training for efficient men? Let the few who have leisure delve in the mysteries of science, or the intricacies of mathematics, but the many must find their work and their wisdom in a trade well learned. This view is supported by a grand array of facts where none are needed, while only conjectures are offered to prove the doubtful statement, that proper education and true wisdom will result from such training in a single art or in several of them.

But, without deciding the question, let us briefly examine the nature and the relation of science and these arts with a view to their use in the training of youth up to maturity, so as to develop the ability sought in every system of education.

Science — and I suppose we shall all accept the definition — is such an arrangement of the facts in the world of nature, including humanity, as to set forth the underlying principles of its existence. Facts without clear logical arrangement are not science; and speculations without facts are not science, — though both may be involved in its study. Science seeks to bring all facts and all phenomena into their proper relations as cause or effect. The man of science gathers facts for classification and analysis, that he may know, not only of what the world is made, but how its parts are adjusted, and under what uniform principles it takes its onward course. The laws of mind and matter are his never-ending study. Do not smile in superior wisdom, if he cannot tell you the definite use of all his knowledge. You might find the same difficulty in answering the simple question, What is the use of sunlight? All of us believe that knowledge truly scientific is the basis of all prudent action and of all progress; and — leaving pure wickedness aside — that imperfect, that is, unscientific, knowledge is the source of all waste and destruction, the "little learning" which is the "dangerous thing." Need the scientific investigator trouble himself about the immediate application of his discovery under patent of his government or for his own benefit, when he finds that every universal fact in the past has found its niche in the world of action? Every day brings to notice the boundaries of human power because of limited knowledge. Like Agassiz and Faraday, he has "no time to make money," because he is making the truth for future generations. The fortune he labors to leave to the world is always as dear to him as if it were counted in stocks or bonds or golden eagles; for it represents his labor of love to the world.

That even abstruse science is of use to the world — to you and to me — may be shown in a general way by illustrations. Nothing could seem less immediately useful than Galvani's tickling the frog's leg with his various metallic points, or Volta's playing with his little metal discs; and yet it is easy to see that the whole system of telegraphs, telephones, electric lights, and storm signals grows out of such insignificant beginnings. If these men or their hundreds of successors had worked only upon the investigation that pays cash down, neither they nor their work would have troubled the world long; and we their beneficiaries might have plodded along unconscious of a weight of obligation. Are we sorry that those men pursued science for its own truth's sake?

To you and me it seems a waste, perhaps, to spend whole years in preparation, and whole days and nights in counting, comparing and measuring the relations of more than 200,000 fixed stars; and yet, it is by just such perfect mapping of the heavens that trackless seas are made safe thoroughfares for the nations and their wares. Thus the stars become the seaman's guideposts, an essential in the machinery of commerce, and so efficient agents to every artisan, every business man, and every plowman.

This work could never have been done for only its immediate use. Only the loving zeal of the true scientific spirit could have wrought with the needed patience in all that complicated machinery, physical and mathematical, which makes such work possible and accurate. Even the larger and more definite view of the universe, in which we are a part, gained now by every child in our public schools, may well repay the race for the cost of such an undertaking.

But when we think that every advance in general wealth and power is a triumph of mind over matter, and that every triumph is an application of scientific truth mined for by students of science, with the patience and endurance of devotees, we can but bow under the rule of science, as the mistress of power, and render homage to such prime ministers of hers as Galileo, Kepler, Newton, Faraday, Agassiz and Henry. If we can find a part of the race without strength to do more than live in a combat with the elements, we are sure of its being outside the realm of science.

[*To be continued next week.*]

IT is Bishop Hall who has said: "No man is so worthy of envy as he that can be cheerful in want." So he that can be hopeful under disappointment and failure, is often happier than he who wins success. For success often brings disappointment, the coveted prize losing half its value when once in our possession, while failure to the man of energetic temperament is only a stimulus to hopeful exertion; and "the reward of life is in the race we run, not in the prize."

THE INDUSTRIALIST.

SATURDAY, OCTOBER 18, 1879.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

The Three R's.

The ability to read understandingly, to express one's thoughts fluently and correctly, and to perform quickly and accurately the numerical computations which arise in ordinary business transactions, are the least which ought to be expected as the result of the usual course in the common schools.

Now, this is all comprehended under the three R's, which it is fashionable to deride, as though the three R's usually amounted to but little in a common-school course; but we contend that he who knows the three R's has laid the only foundation which can be laid for a good education, and has also a good preparation for a successful business career. Let us notice what is included in the first two R's, for the attainment of which our grandfathers when boys used to go to school.

Reading is something more than the ability to pronounce words at sight. He only reads who is able to comprehend the thought that is presented on the printed page, as readily and as clearly as he does when it is enunciated by an animated speaker. He has not yet learned to read who cannot at a glance comprehend the sense of a sentence as soon as his eye takes in the words. Of course this applies only to subjects with which one is familiar, and to thoughts expressed by words whose meaning is known.

The second R, or writing, is something more than forming letters with a pen. It is the ability to express one's thoughts readily, forcibly and correctly, in writing. How often it is that as soon as the pen is taken up the current of thought ceases to flow. Why is this? It is because the person has not learned to write.

Both reading and writing, in this sense, are arts, to be acquired as other arts are, by drill and practice. A child learns to speak by hearing others speak. With the first gleam of intelligence he acquires the meaning of words. Before he can speak it he knows what is meant when he hears the word spoken. It is the work of the teacher simply to teach the child to know at sight the printed word which he already knows, and attach to it the meaning which he has been accustomed to give it. If the proper course is taken, the child will learn to read as readily and as naturally as he learns to talk. He will also as readily understand what is expressed by written language as what is expressed in speech. As soon as the child can form letters with a pen, he should be trained to express his thoughts on paper. Teachers are often troubled by whispering in school. Let the whispering be done on paper, that is, encourage children to express their thoughts to each other in writing, with the provision that all communications of this kind are subject to the examination of the teacher, and a school annoyance is at once changed to a profitable exercise. In a primary school, such exercises should be had several times a day, lasting only so long as the children are interested in them. The brightest children often do a good deal of this correspondence surreptitiously, and are profited thereby, but not near so much as they would be were it done under the direction of their teacher.

The great thing to be aimed at by the teachers in our common schools is to make their pupils good readers and good writers, in the view taken above. With the ability thus to read usually comes a taste for reading. Let this once be acquired, and, provided proper books are at hand, intellectual growth is certain. If a course of study is taken, the text-books in the different sciences are easily comprehended. The printed page in the quiet study speaks directly to the receptive mind. In the recitation-room, the principles comprehended are readily expressed, recast in another form, according to the mould of the individual mind. Progress is rapid, and the hill of science easily climbed.

In the common schools, let the three R's have the chief place, then can the high schools and colleges be left to do their proper work.—*Prof. Ward.*

Natural Agencies in the Control of Noxious Insects.

However valuable, in particular instances, may be considered the inventions for controlling or subduing injurious insects, it is plain that, in the great majority of cases, the main dependence must be placed upon natural agencies. Prominent among these are insectivorous birds, and the assistance rendered the agriculturist by these friends can scarcely be overestimated. They are entomologizing at all seasons, and at all hours. The great amount of food demanded by such active, warm-blooded creatures renders necessary a constant search for the insects which furnish the most staple article in the bird's bill of fare.

Although it is not to be expected that birds will discriminate closely between injurious and beneficial insects, yet the facts show that the former furnish the bulk of their food, while those insects that are themselves the allies of the farmer are less frequently taken. In many cases this is doubtless owing to the more sluggish nature of the plant-feeders and the great activity of the carnivorous species; while in others, it is evidently attributable to the superior abundance of the former.

In the report of the United States Entomological Commission upon the Rocky Mountain Locust, Prof. Aughey furnishes an interesting and instructive tabulation of the results of his examinations of the food found in the stomachs of birds collected by him at different dates during a period of thirteen years. The number of specimens examined was over six hundred, belonging to about ninety species; and it was demonstrated in these examinations that, taking the entire number of species, including the birds not ordinarily considered insectivorous, such as hawks, owls, and water-birds, the bulk of the contents of their stomachs was made up of insects. Special notice having been taken of the proportion or relative number of locusts found, it was shown that these destructive insects furnished from one-third to four-fifths, or in some cases even more, of the food of such birds.

Some hawks subsist almost exclusively upon insects, varying this diet occasionally by the capture of small animals; others feed upon insects only when the supply of other food is limited. There is scarcely a bird that will not, in seasons when insects are abundant and consequently destructive, make great use of them as food.

Insectivorous mammals and reptiles are in the same category with insectivorous birds, and the remarks concerning the usefulness of the latter will apply also to these. Weasels, skunks, squirrels and field-mice, although naturally preferring other food, are known to devour a great many insects. The skunk, especially, depends largely upon the supply of insects for food, since, not possessing the agility of the weasels and minks, it is less able than they to catch small animals and birds, which its carnivorous propensities would otherwise lead it to do. Shrews, moles and bats are entirely insectivorous in their diet.

But by far the most important agency in the reduction of the numbers of injurious insects is their destruction by parasitic and cannibal foes of their own class. It has been said by a competent authority that each kind of caterpillar has its own peculiar parasite, and some are known to be preyed upon by more than one. The army-worm is liable to be infested by no less than eight different internal parasites. Bark beetles and borers, living in the outer layers of wood, are pursued in their retreats by the carnivorous larvæ of other beetles. The burrows of the larger borers are followed through several inches of wood by the ovipositor of the *Pimpla lunator*, which thus reaches the hidden larva and deposits upon its body the egg from which will finally hatch a destroying parasite. Cut-worms, wire-worms, and other destructive insects that live underground, are pursued by the larvæ of the predaceous ground-beetles; the underground aphis, that so injuriously infests the roots of the apple-tree, is sought out and devoured by the predaceous larva of a syrphus-fly; the protecting scale of the apple-tree bark-louse is pierced by a minute chalcis-fly, whose larva, hatching from the egg deposited within, attains its growth at the expense of the bark-louse and its eggs. No protection avails, no retreat is secure from invasion by these merciless pursuers.

It would appear highly important that those in whose interest these parasites are working should recognize the assistance and value of these allies in the warfare against noxious insects, and discriminate in their favor, preserving them, and furthering their increase and distribution by all available means. To this end, it is necessary that more prominence than it now has be given the study of economic entomology, which might reasonably demand as much attention from students of all ages as the related sciences of botany, chemistry or geology.—*Prof. Popenoe.*

Popular Education. No. II.

Accepting this as a fundamental maxim, that "Whatever should enter into the life of a nation should be taught in the public schools," let us consider some things that enter into the life of a prosperous people.

Man lives not by bread alone; and the culture of the heart only ensures a perfect life, either of an individual or of a nation. Hence, the schools of a country should not be irreligious or godless. Both by precept and example, the precepts of religion should be taught. The highest standard of morals should be enforced. None but men and women of the noblest character and purest life should be allowed to teach the youth. If religion and morality are to enter into the complex life of the nation, they must not be banished from the public schools.

If a nation prospers, industry, frugality and economy must enter into its life. Hence, these old-fashioned virtues should have a place in the schools. The young should be taught that an education fits them for work, not to live without work. In school, the young man should learn the value of time, and should be taught how to fill up the days and the years, as they pass, with profitable industry or substantial enjoyment; for true living is what is enjoyed, whether it be in the gratification of the present, or for that in the future which promises an enjoyment that more than counterbalances the self-denial of the present. Let the youth in our schools be taught that labor is Heaven's great ordinance for human improvement, and the prosperity of the nation cannot be checked by senseless theories of finance. Frugality, as opposed to a useless expenditure of money, should be inculcated. This must be mainly done by the State, in its expenditure of money for the erection of school buildings, in the cost of text-books, and in the general management of the schools. This should not descend to a niggard parsimony; but when, with borrowed money, school-houses are erected and furnished with an elegance far beyond that which is found in the homes of the people, is it not an encouragement to the young men of the State to go beyond their own means to build homes for themselves, provided they have a little credit?

In France the public school is made an agent in developing and strengthening the virtue of economy. An annual premium of 100 to 150 francs is given to the most diligent and well-behaved child of every hundred in the public schools. This money is placed in a savings' bank. The child is furnished with a bank-book. He can add to the sum deposited, but he cannot draw it out until he attains his majority, when the whole sum is his own. Children are encouraged to save their money. They are allowed to place the smallest sums, even to a sou, in the hands of their teachers, who are required to keep an account with each child. When the sum amounts to a franc, it is deposited in the savings' bank. Thus thousands of children are laying up small sums of money; and, at the same time, they are acquiring those habits of economy which have so long characterized the French people.—*Prof. Ward.*

THE INDUSTRIALIST.

SATURDAY, OCTOBER 18, 1879.

Instead of the usual circular or catalogue, we send the Industrialist to those desiring information about the Kansas State Agricultural College. We would call attention to the articles headed "Departments of Instruction," "Industrial Education," "Special Advantages," and "Directions to Applicants." If further information is desired, address Agricultural College, Manhattan, Kansas.

The merry hum of the threshing machine comes to us from the College barn, as we go to press.

There was a fine rain throughout this section Wednesday night. The total rain-fall for the week is 2.28 inches.

All persons having accounts against the College must present the same to the Secretary of the College on the first of each month.

We have enrolled and assigned to recitations 212 students this term. Forty-seven counties of Kansas are represented in the Institution.

At the Faculty meeting of Tuesday last, the universal report of the teachers was to the effect that good work was being done, and lots of it.

The grades for the first month are out, and are being mailed to the parents and guardians of our students. On the whole, the work done the past month was very satisfactory.

The young Short-horn bull owned by Bill & Burnham, which was so much admired on the Fair grounds, and which took the first prize in his class, it may not be amiss for us to say was bred by the College.

A young Jersey bull has been secured for the College farm from the herd of Hon. Welcome Wells. He is not a beauty by any means, and who ever saw a Jersey that was. But handsome is that handsome does.

Mr. Huey, of Potta-what-do-you-call-em county, came on the Hill Thursday, and succeeded in carrying off the handsome yearling Short-horn bull, "Viceroy." Price, $125. Mr. Huey gets a bargain, and he knows it.

Students enrolled since our last issue: *Atchison county*—John C. Rust; *Dickinson*—Geo. R. Herr, John E. Gish, and Christian S. Kraybill; *Coffey*—G. K. Estes; *Saline*—Erskin Blosser; *Riley*—E. V. Cripps and Sarah Craig.

We wonder if all these "balances" and fine apparatus will not give to the head of the Chemical Department "airs" and a swaggering gait. Had all this happened a year ago, we should have expected some wretch to rise and ask whether these balances would weigh a Pound.

Mr. Rollins' magnificent herd of Berkshires, at Kansas City, Topeka and Manhattan, took well-nigh every prize for which it could be entered. This, however,—and we say it with proper modesty,—is no more than might have been expected, for Mr. R. purchased his first Berkshires of the College, and since that time has been our most liberal patron.

The following named students graded 95 or upwards during the last month: Frank L. Abbey, E. P. Coleman, J. T. Copley, A. Copley, Eva Couse, Ida Cranford, G. B. Gallagher, Lydia P. Gardiner, George Hopper, Mina Hosmer, Emma Hoyt, Warren Knaus, Emma Knostman, Dalinda Mason, Grace Parker, Noble Richardson, Belle Selby, and Maria E. Sickles.

The Alpha Beta Society has lately added to its library the following books: Prescott's Conquest of Mexico, 3 volumes; Whittier's Poems; Longfellow's Poems; Shakespeare's Dramatic Works; Foreign Gleanings, by Gladstone, Lecky, and Von Schulte; Socialism; Mrs. Caudle's Curtain Lectures; and a number of the "Acme Library" series of standard biographies, including such characters as Robert Burns, Joan of Arc, Martin Luther, Frederick the Great, Mary Stuart, and others.

I am called upon to report one of the most interesting sessions of the Webster Society that I ever had the honor to attend. After roll-call and prayer, Messrs. Donaldson and Hollenberg were initiated. Under the order of debate, the judges decided that the Americans were not half so smart as some nations they might mention. It seems to me—perhaps a superficial observer—that there is something strange in this continued calumny upon the Americans. In extemporaneous speaking, the merits of Napoleon were thoroughly canvassed. Mr. Rushmore was with us once more, and presented the Society with the famous book, "Tom Sawyer." Six propositions for membership were read. Question for next week, "*Resolved*, That free trade should be adopted by all nations." The question is old, and many newer were suggested, but as long as protection forms a distinctive feature in our American system it is worth discussion. Paper next week by Mr. Sloan.

After some filibustering, the Society adjourned to meet in three minutes, at the end of which time the adjourned session assembled. All orders to that of new business were passed, and after some discussion the Society ordered the subscription of the New York *Tribune*, New York *World*, and *The Popular Science Monthly*, for the exclusive use of the Webster Society. Mr. Wood also agreed to furnish the Chicago *Inter-Ocean* for the same exclusive use of the Society. After some further filibustering, the Society adjourned. WOOD.

The attendance at the Alpha Beta Society on Friday afternoon, Oct. 17th, was the largest of the term. A great many visitors and a number of our brother Websters gathered with us. After preliminary exercises, extemporaneous speaking followed, and was heartily joined in by all. The music committee then entertained us with "Sweet Echo Wake," which was well rendered, after which Mr. Chenoweth and Miss Clarke presented the Society with a choice collection of "gleanings," in the form of our semi-monthly paper. As it was getting late, the order of debate was passed until next week; and, under the head of "miscellaneous business," it was proposed and carried that the Alpha Beta Society invite the Webster Society to unite with them in a joint session, to be held at our first meeting in the new Society Hall.

Since the opening of the term, we have added twenty volumes of new and neatly-bound books to our library, consisting of a superior collection of history, poetry, biography, etc. The members are all interested in promoting the best interests of the Society, and the consequence is one of the most prosperous conditions known in the annals of the Alpha Betas. M. E. S.

PROCEEDINGS OF THE BOARD.

The following are the proceedings of the meeting of the Board of Regents, held October 15th, 1879.

Bills of July, August and September were audited.

Ordered that the west room of the Horticultural Building be fitted with shelves and cases for the reception of horticultural and natural history specimens, at an expense not to exceed $150, the work to be done by the students in the employ of the Superintendent of the Mechanical Department.

During the afternoon session the professors and superintendents of departments appeared before the Board, and presented the reports of the several departments.

The sum of $130 was allowed the Chemical Department, for the purchase of a balance and other apparatus, and chemicals.

The Superintendent of the Department of Industrial Drawing was instructed to secure two tables for his recitation-room, and to purchase models and works of reference at a cost of $35.

For the Mechanical Department $100 was appropriated, to be expended in the purchase of needed tools.

The Sewing Department was allowed $60 for the purchase of two sewing machines.

The sum of $60 was placed at the disposal of the Librarian for the purchase of the first ten volumes of the new edition of the Encyclopedia Britanica.

Prof. Walter's salary was placed at $700, from Sept. 1st, 1879.

Ordered that all salaries of professors and superintendents of departments be paid monthly hereafter.

The maximum rate for students' labor was fixed at eight cents per hour, this order to go into effect Oct. 20th, 1879.

The Superintendent of the Mechanical Department was instructed to furnish with seats the old drawing room, in the "old Hall," for the use of the literary societies.

The Land Commissioner made his report concerning the re-appraisement of College lands, which was adopted, and the Commissioner instructed to re-appraise the College lands in Shawnee county, known as the "Strickler lands."

Board adjourned to meet the second Tuesday in January, 1880.

NATIONALIST ITEMS.

The K. P. is running several extra freight trains, and five hundred new box-cars have been added to the rolling stock.

There is new, green grass, four inches high, on the prairies,—and violets. Just think of it: violets in October! We saw them.

We understand that Geo. A. Wake has sold his property in Ellsworth and moved to Lyons, where he is engaged in the lumber business.

The College and town boys played a match game of ball on the Fair grounds Friday afternoon, and the score sheet showed up quite numerously in favor of the former.

A few days ago we visited Goodnow & Denison's sorghum refinery, on College Hill, and were much pleased to see how nicely everything is arranged for the business in hand.

The excavation for the new engine-house at the big elevator has begun. If it is as handsome a building as the new grist-mill, the block will equal anything in this part of the State.

Mr. and Mrs. J. T. Ritchie are enjoying a catnip honeymoon, their son—Charles Edward—having announced, last Tuesday, that he had come to stay. When we saw Jeems walking in the air, we didn't know what was the matter until his clarion notes, far up the hights, replied, "He weighs nine pounds and a half, and we call him Jack,"—Excelsior.

DIRECTIONS TO APPLICANTS.

TERMS OF ADMISSION.

Candidates for admission must be fourteen years of age, and pass a satisfactory examination in reading; arithmetic, through decimal fractions; and English grammar, to syntax. Classes are started at the beginning of each year in Drill in Arithmetic and Drill in English; and the pupil must have the knowledge above indicated, else he will be unable to retain position if admitted.

Pupils will be received at any time during the year, if able to pass an additional examination upon the subjects studied by the classes which they expect to enter. But they will find it greatly to their advantage to be present at the opening of each term, or as soon thereafter as possible.

GRADES.

Both the Literary and Industrial recitations are graded daily upon a scale of 100; and an examination of all classes is made at the close of each month. A student not attaining an average grade of sixty is promptly dropped to a lower class, or excluded from the Institution until able to do so. The work of grading is strict and uniform in all the departments, and this process is rigorously used for sifting out incompetent and indolent pupils; thus more than accomplishing all that is designed to be effected by a "high standard of admission." Hence, the student's continuance in the College wholly depends upon his own action.

The course is based upon the determination to make the labor required in the preparation of one industrial and three literary recitations as much as the average student can perfectly perform, in ten hours a day. We design to give the pupil the worth of the time expended at College; and, in order thereto, he must do a full day's work with brain or hand. Only those students who can maintain a standing of ninety in each study will be allowed to take more than the prescribed number of recitations; and no one will be permitted to have less than one industrial and three literary recitations.

RELIGIOUS.

Unless otherwise directed by parents, students are required to attend chapel at 8:30 A. M. on academic days, and divine service once every Sabbath.

EXPENSES.

There are no charges whatever for enrollment, attendance or instruction in the regular courses; nor are there any "contingent fees" for the repair of buildings, for the use of books or apparatus, for diplomas, or the kindred privileges usually grouped under the term "contingent." Male students are furnished instruction, the use of apparatus, instruments or tools, in both the literary and industrial classes marked out for them, without any charge. And the same is true of female students in the regular classes provided for them. Printing and Telegraphy are industrials primarily provided for the education of female students, and male students taking either of these are charged $1 per month for use of instruments.

Instrumental music is a fine art or "accomplishment," rather than a mechanical art. We do not place it among our "industrials" in the same sense, or for the same purpose, that we do those provided for teaching the trades. Accordingly, the following fee is required from female students for tuition and the use of instruments:

Terms per week:

Private lessons, 2 a week, on any instrument, $1.00
Private lessons, 1 a week, on any instrument, .60
Class lessons, 2 a week, on any instrument, .65

Instruction in harmony, etc., etc., from ten to fifty cents per week, as the student may or may not be in other classes.

The only charge made for material in either the literary or industrial departments is for the chemicals used by students in laboratory practice, which are furnished at wholesale prices, and amount to but a small sum.

Furnishing an absolutely free education is as much as can be reasonably asked; and the Institution neither boards, clothes, nor supplies the student with text-books. Boarding can be obtained in private families at from $2.75 to $4 per week. Washing costs from seventy-five cents to one dollar per dozen. Text-books, which can be procured in Manhattan, cost from $2 to $5 per term.

No student need expend over $5 per week; and many of our best pupils are living at $1.25 per week. Students desiring to "board themselves" can do so at from $1 to $2 per week. In a club of four young men, renting a house, the average cost to each for the term was $1.11 per week.

LABOR.

Manual labor by the students may be for either of two purposes: First, to acquire skill in a given art; second, to earn money. In the first case, the labor is educational; in the second, it should be paid for by the party benefited.

Educational Labor.—Manual labor in the recitations of the Industrial Departments, like mental labor in those of the Literary Departments, is purely educational and will not be remunerated. While the interest of the student will be held paramount in the direction of this labor, the practice necessary to dexterity will be required.

Remunerated Labor.—When the Institution needs labor on the Farm or elsewhere which is not educational, but simply for its own profit, and which a student is able and willing to perform, it becomes an employer instead of a teacher, and he an employe instead of a scholar. It pays for work, he works for pay. The relation between them is commercial, not educational; and both parties must act upon business principles. Hence, the College furnishes only such employment as its own interests require, and will pay according to the value of the service rendered at from seven to ten cents an hour.

AMOUNT EARNED.

It is impossible to predict how much a given person can earn, since that depends upon what he can do and what work there is to be done. Hence, it is wholly impossible for us to answer the question so often asked: "Do you think I can meet my expenses by work?" Some students make one-half their expenses; some the whole, and exceptional men have made more than expenses. As a rule, a faithful boy skilled in farm work can earn half his expenses on the Farm or in the Nursery. During the year he can ordinarily acquire sufficient skill in the wood or iron shops to enable him to make articles for sale. The whole question is one for his own consideration and decision. We can teach all who come, but cannot absolutely *promise* anything more. Hitherto we have refrained from holding out strong inducements respecting the amount of labor we might have to offer; but in view of the fact that during each of the last three years we have had more to do than the students could perform, we are inclined to give greater and positive encouragement on this point. Any boy who is in dead earnest, who is familiar with farm operations, and who can raise $50 to start with, should be able to carry himself through the four years' course. And certainly this places an education within the reach of every determined boy. As yet we are unable to offer similar advantages to girls, not requiring labor in the College departments which they can perform.

RULES.

1. Behave as a true man or woman should, at all times and in all places.

2. Attend to your own business promptly, thoroughly and courteously; and vigorously let alone that of other people.

3. Penalty: "Leave!"

PUBLICATIONS.

The "Hand-Book," published in 1874, containing a full discussion of the educational question and the aims of the Institution, will be forwarded to any one desiring it.

THE INDUSTRIALIST, a weekly journal edited by the Faculty and published by the Printing Department, contains original and seasonable articles on the Farm, Orchard, Trades, Sciences, and Education. Price, 75 cents a year. Address A. A. Stewart, Manhattan.

CALENDAR.

Fall Term, 1879.—Began Wednesday, September 10th, 1879, and will close December 18th, 1879.

TO NEW STUDENTS.

Bring the text-books you have been using. On arrival, first arrange for your boarding. A. A. Stewart will furnish information, either by letter or on application, concerning boarding places or rooms for rent. Report to the President at 8:30 A. M., immediately after chapel exercises, for enrollment.

For further information apply to M. L. Ward, President *pro tem*, Manhattan, Kansas.

LITERARY SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in the College Chapel every Friday at 2 P. M. Ladies admitted. New students cordially invited to attend. GEORGE ROSE, President.
MISS ROWENA WHALEY, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Telegraph Hall every Saturday evening. Visitors, especially students, always welcome.
NOBLE A. RICHARDSON, President.
GEORGE F. THOMPSON, Secretary.

RAILROAD TIME-TABLE.

KANSAS PACIFIC RAILWAY.

PASSENGER ARRIVES.

No. 2, going East	11:58 A. M.
No. 4, going East	3:28 A. M.
No. 1, going West	4:03 P. M.
No. 3, going West	4:51 A. M.
No. 7 (freight), going West	8:45 A. M.

Nos. 1, 2 and 7 run daily. No. 3 runs daily except Monday. No. 4 runs daily except Sunday. Passengers with tickets are carried on No. 7.
GEO. C. WILDER, Agent.

THE INDUSTRIALIST.

SATURDAY, OCTOBER 18, 1879.

Industrial Education.

The real value of an education to the student depends upon two things: First, the practical worth of the knowledge taught; and, second, the degree in which he makes it his own. Hence, the ability of any institution to give a practical education depends upon the kind and aim of the knowledge it teaches, and upon the thoroughness of the instruction therein. The State Agricultural College was directly endowed by Congress, and is guided by the State, for the specific purpose of furnishing to the industrial classes of Kansas a "practical" education, that is, "one fit for use." As its name indicates, and as the statistics of the industries of the State require, its chief work must be that of giving a useful and usable education to those who will engage in farming; and, therefore, the Farmer's Course must, from the nature of the case, be its main one.

FARMER'S EDUCATION.

Words and figures are merely instruments with which to record ideas. They are not themselves ideas, nor should they be made the chief end of an education. As a wagon is necessary to haul grain, so are they a necessary part of an education; but as the wagon is not the grain, so they are not the knowledge which the farmer converts into money. Hence, the classics and higher mathematics are not taught. But it will be noticed in the following course that so soon as the pupil acquires working skill in the use of the English language as a tool, and of figures and lines as mathematical tools, those arts and sciences which present knowledge that has a cash value to the farmer are taught as rapidly as their importance and thorough acquisition will permit. Studies numbered (1) and (4) in the second, third and fourth years are the spine of the course, to which the others are as ribs and muscle.

FARMER'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Practical Agriculture (advanced.)		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	1. Drill in English.
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	2. Drill in Arithmetic.
3. Polit. Economy, Practical Law.		3. Practical Geometry.		3. Algebra.		3. Industrial Drawing.	3. Industrial Drawing.
4. Zoology.		4. Horticul., Landscape Gardening.		4. Practical Agricul. (elementary).		4. English Structure.	4. English Structure.
5. Agricul. Chemistry	Meteorology.	5. Organic, Analytical Chemistry.		5. Physics.		5. Adv'd Arithmetic, Book-keeping.	5. Adv'd Arithmetic, Book-keeping.
6. Logic.		6. Practical Surveying.		6. Industrial Drawing.		6. U.S. History, Industrial Drawing.	6. U.S. History, Industrial Drawing.

WOMAN'S EDUCATION.

Nearly one-half of our students are females, and the Woman's Course is prepared expressly for their liberal and practical education. We have no doubt whatever that practical men and women, who understand what it means and what it seeks to do, will fully endorse it.

WOMAN'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Farm Economy, Special Hygiene.		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	1. Drill in English.
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	2. Drill in Arithmetic.
3. Polit. Economy, Practical Law.		3. Industrial Drawing.		3. Algebra.		3. Industrial Drawing.	3. Industrial Drawing.
4. Zoology.		4. Horticul., Landscape Gardening.		4. English Literature.		4. English Structure.	4. English Structure.
5. Phys'c'l Geography, Meteorology.		5. Organic, Household Chemistry.		5. Physics.		5. Adv'd Arith., Book-keeping.	5. Adv'd Arithmetic, Book-keeping.
6. Logic.		6. Household Economy.		6. Industrial Drawing.		6. U.S. History, Industrial Drawing.	6. U.S. History, Industrial Drawing.

MECHANIC'S EDUCATION.

Because of the adaptedness of the leading course to the wants of the intelligent mechanic, it has been found practically unnecessary to diverge from the Farmer's Course. Additional studies, specially adapted to the mechanic's use, will be furnished in a Post-Graduate's Course.

If it be urged that the distinctively agricultural knowledge taught in the Farmer's Course is not directly valuable to the mechanic, we reply that, admitting the point for the purpose of argument, yet: 1. This knowledge is of more practical value to the mechanic than is the Latin, Greek, or a half dozen other things embraced in the usual course preparatory to the professions; 2. That the great majority of Kansas mechanics will also be more or less engaged in agriculture; 3. That those studies in the course which are directly valuable to the mechanic, together with the shop facilities, offer a better mechanic's education than can be elsewhere found west of the Alleghanies.

INDUSTRIAL DEPARTMENTS.

Having knowledge in the head is one thing; ability to use it with the tongue, fingers or feet is quite another thing. Both are vital to success in practical life. A man might thoroughly understand the theoretical principles of carpentry, and yet, not having used the tools, be wholly unable to earn carpenter's wages. So in all other vocations. Accordingly, instruction is given in the following well-equipped Industrial Departments, and every student is required to recite in some one of them, as selected by the pupil or parent:

FOR MALE STUDENTS.	FOR FEMALE STUDENTS.
The Farm.	Dress-making.
The Nursery.	Printing.
Carpentry.	Telegraphy.
Cabinet-making.	Scroll-sawing.
Turning.	Carving.
Wagon-making.	Engraving.
Painting.	Photography.
Blacksmithing.	Instrumental Music.

Each of these departments is conducted exactly as in daily life, and aims to give precisely the drill received by an apprentice. No charge is made, either for tuition or material, from male students taking the Industrials provided for them; nor from female students taking the ones provided for them, except in Instrumental Music. Male students taking either Printing or Telegraphy are charged $1.00 per month for the use of instruments and material.

DEPARTMENTS OF INSTRUCTION.

DEPARTMENT OF AGRICULTURE.

PRACTICAL AGRICULTURE.

Second Year:—General principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage.

Fourth Year: General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of a rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farmhouses; barns.

FARM ECONOMY.

Woman's Course, Fourth Year: Dairy products as human food; influences affecting character of milk; manufacture of condensed milk; the factory system and household plan of cheese-making; treatment of rennet; general process of cheese manufacture; subsequent treatment of cheese; butter-making; creameries; "deep" and "shallow" setting systems; general process of butter-making; packing and preserving butter.

DEPARTMENT OF BOTANY AND PRACTICAL HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest; also a course of lectures on Landscape Gardening. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard; fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture; shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in in the work of laying out and plotting grounds topographically.

CHEMICAL DEPARTMENT.

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life. Text-book, Ganot.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blowpipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

Are constantly in progress in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

DRILL IN ENGLISH.

"As grammar was made after language, so ought it to be taught after language."—*Herbert Spencer.*

Drill in English embraces the following topics:

Sounds of the language; drill in producing the vocal, sub-vocal and aspirate elements with accuracy, distinctness and volume; vowels, consonants.

Letters: Form; power; rules for spelling, drill.

Words: Signification, properties, modifications, variations, relation and dependence.

Sentences: Drill in statement of ideas; description, clearness, terseness, vigor; business letters, discussion; capitalization; syllabication; punctuation; construction and analysis of sentences; elements, uses and names; criticism of compositions printed as written; proof reading; grammatical construction; superfluous words and clauses; drill in reading, speaking and penmanship.

Text-books: Webster's Academic Dictionary; Lee & Hadley's Advanced Lessons in Language.

Pupils deficient in spelling, etc., should enter the printing class, the printing-office being the work-shop of language.

STRUCTURE OF ENGLISH.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

MATHEMATICAL DEPARTMENT.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

DRILL IN ARITHMETIC.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Following this line, the student, so far from hammering away at "pure" science draws from the mathematical store-house what he needs, and sees why he needs it. Accuracy of calculation and posting, rather than a *mere* comprehension of the principles, is aimed at. Besides the recitation-room drill in business forms, practice in the field is also given. Estimating the number of cords in a pile of wood said to be 100x4x4 feet is one thing; measuring a pile of wood through which any number of cats may be harmlessly thrown, and in which four-feet sticks are the exception, is quite another and more difficult thing.

ARITHMETIC AND BOOK-KEEPING

Is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides ensuring arithmetical practice, develops practical skill in that important art.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admiral system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study. In addition, constant practice in the application of lines to metal and wood is furnished in the Blacksmith, Carpenter, Turning, Scroll-sawing, Carving, Engraving and Printing shops, and to fabrics in the Sewing Department.

PRACTICAL GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the use of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

PRACTICAL SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

STUDIES SPECIAL TO WOMAN.

Besides the studies already indicated, attention is called to the following:

SPECIAL HYGIENE.

As shown in the course, one term is devoted to the study of Physiology, from the text-book of Dr. J. C. Dalton. This is followed in the fourth year by a course of lectures to young ladies by Mrs. Cripps on the subject of Hygiene, embracing such instruction in hygienic matters as are valuable to woman.

FARM ECONOMY considers those affairs of the farm which usually come under the supervision of the farmer's wife or daughter, and which are not included in "gardening" or "household economy;" such as butter and cheese-making, dairy management, etc. A course of lectures is delivered by the Professor of Practical Agriculture. See heading, "Farm Economy."

GARDENING is included in Practical Horticulture. See heading, "Landscape Gardening."

HOUSEHOLD CHEMISTRY. See heading, "Household Chemistry."

HOUSEHOLD ECONOMY

Follows Household Chemistry and consists of lectures by Mrs. Cripps on the art of house-keeping, embracing cookery, domestic management, and kindred topics. Many elderly gentlemen sufficiently know, and more young gentlemen will duly discover, that systematic knowledge of how cooking ought to be done is luminously different from the ability to do it. Instruction without practice can effect but little. Accordingly, a kitchen laboratory has been completely furnished, and affords every facility for drill in the art of cooking. This drill chiefly differs from that of a kitchen in the respect that after a girl has learned to wash dishes or pare potatoes she is not kept everlastingly at either. After full trial, we have found it just as feasible to give this practice, with profit and pleasure to the pupil, as it is to give laboratory practice in chemistry,—and no more expensive.

Printing!—Daily instruction and drill in the work of a First-Class Printer. The Literary Departments offer a thorough education in the construction and use of the English Language, as employed by the Proof-Reader; in Book-Keeping; and in Industrial Drawing, as the best developer of that taste necessarily exercised by every good Job Printer. The Printing Department is well furnished with all the facilities for a speedy mastery of the art of Printing, and is in charge of a practical printer. Besides regular class instruction in printing, the weekly publication of the INDUSTRIALIST by the Department furnishes advanced students the requisite drill in newspaper work.

THE INDUSTRIALIST

VOL. V. MANHATTAN, KANSAS, SATURDAY, OCTOBER 25, 1879. No. 28.

THE INDUSTRIALIST.

Published every Saturday by the
PRINTING DEPARTMENT
OF THE
KANSAS STATE AGRICULTURAL COLLEGE.

TERMS OF SUBSCRIPTION, 75 cents per year, postage prepaid. Ten cents per month, postage prepaid. Payment absolutely in advance! Paper stopped at expiration of subscription.
Address A. A. STEWART, Manhattan, Kas.

THIS College furnishes a thorough and direct education to those who intend to be Farmers, Mechanics, or to follow other industrial pursuits. As a foundation for each course of study, and for success in daily life, the first object is to make every student an expert in the use of the English Language as an art; and, also, an expert in Practical Mathematics, including skill in the use of numbers; in the use of lines, or Industrial Drawing; and in Book-keeping.

FARMER'S COURSE.

Building on this foundation, the special object of the Farmer's Course is to give the student a practical knowledge of the structure, growth, and value of Plants; of light, heat, and moisture; and of Inorganic, Organic, Analytical and Agricultural Chemistry, as these are related to Plant and Animal Growth; of Economic Zoology; and particularly of Practical Agriculture and Horticulture, including such instruction and drill in the Field, in the handling of Stock, in the Nursery, and in the Wood and Iron shops, as will enable the graduate to perform readily each of the varied operations of actual Farm Life. The Farmer's Course is the leading one of the Institution.

MECHANIC'S COURSE.

To Mechanics, in addition to the studies of the Farmer's Course, applied Mathematics and Industrial Drawing are more extensively taught. Besides this literary education, the student is taught daily in the particular work-shop of his trade. Special advantages are thus offered to those who wish an education as a Carpenter, Cabinet-maker, Wagon-maker, Blacksmith, Turner, Carver, or Engraver. No charge made for the use of tools or materials for class practice.

WOMAN'S COURSE.

The course of study for woman is more practical and, therefore, more sensible than that found in any other institution in the United States. The studies are shaped with reference to the liberal and direct education of woman as a woman instead of as a man, and as an industrialist instead of a butterfly. Among the special features of the course are Physiology and Special Hygiene, Household Economy, Farm Economy, Gardening, Household Chemistry, etc. The work-shops include those of Millinery and Dress-making, Printing, Telegraphy, Scroll-sawing, Carving, Engraving and Instrumental Music.

TUITION ABSOLUTELY FREE!

No contingent fees, except for use of pianos and organs in the Musical Department; and a charge of $1.00 per month for material and instruments used by male students in Printing and Telegraph Departments. Boarding ranges from $2.50 to $3.50 per week.

CALENDAR: — Fall Term began September 10th, 1879, and will close December 18th, 1879.

For further information, apply to
M. L. WARD, President *pro tem.*

Science and the Industrial Arts in Education.

[Extract from a lecture delivered at Charlotte and Flint Institutes, in Michigan, by President George T. Fairchild.]

But in thus paying tribute to science do we disparage the arts? No! If science is made up of classified facts grouped under principles, the arts are applications of those principles in meeting wants and susceptibilities. The very inventions by which discoveries of science are made useful, and the very materials that science grows upon, are from the arts. If science is the source of power, the arts are its means of conveyance. Everywhere in the history of the world the two have helped each other. Whenever and wherever for any reason science has been suppressed, the arts have awaited its emancipation. Think of the middle ages, shut up to the arts of adornment, because it was sacrilege to know more of the universe than patriarchs, apostles and fathers had taught! Think of Spain under a niggardly fear of intelligence! Remember our own sunny South untaught in science and unskilled in the industrial arts. On the other hand, wherever for any reason the useful arts have lagged behind, science has degenerated into mere curious speculations about possible or conceivable relations, with little attention to actual facts. Then both knowledge and art fall together. Such appeared to be the condition of that ancient civilization when a philosopher felt obliged to apologize to his fellow wisemen for having once prostituted his learning to utility: he had enumerated among the advantages of philosophy a few material comforts derived from it. Such may be our fate, if we allow a divorcement of these perpetual partners in human progress.

But to realize how closely and united these are, it is best to analyze further their bond of union. In what respects is one the constant attendant of the others in every-day life? I have shown in a general way how science everywhere pervades the arts, giving them dignity and efficiency, and how the arts utilize science in its various minutiæ and support it in healthy growth. Every person can add from his own experience and knowledge abundance of illustrations. If agriculture has owed less than other arts in the past, it has been because of a forced separation under a too narrow view of the art, or a faulty conception of the possibilities in science applied to the soil. Yet even here there is enough to encourage the most doubtful in an effort for closer union. The oft-noted failures in so-called book-farming are themselves a proof of the need of a proper combination of science and art in this calling. Any effort to treat a general principle as a practical rule, to be followed in all conditions, is trying to use science as an art; and any effort to extend a practical rule of a certain experience into a general principle, is to misuse an art by treating it as science. Both these efforts cause failures, loss of wealth, loss of hope, and loss of faith; and both are the result of imperfectly mastered science or poorly developed skill. Sometimes chemical and botanical science have wandered into vain speculations as to agriculture, simply because practice lagged too far behind to keep these sciences on their mettle. Sometimes a practical rule of merit has been too hastily thrown aside or disputed, simply because it was stated as a principle. The question of deep and shallow plowing, so often bantered about in farmers' clubs and agricultural journals, is usually stated as a question of science; but each individual's answer to the question is simply a part of his rule of conduct for a successful crop. As experience, it forms one item of value among a long list to be grouped around the underlying principles of vegetable growth. The same may be said for the ever-reviving chess controversy. So long as a practical wheat-grower holds to the statement that if he himself suffers in his wheat-field a certain amount of trampling or frost, it will produce for him a crop of chess, he is doubtless correct, for he is giving only a rule for his own proper guidance. When he merely changes the person and says, "If you treat your wheat-field in this way, it will produce chess," he may or may not be correct, according to varying conditions of clean seed or clean soil. But when he states that the wheat-plant turns into a chess-plant under such treatment, he has put his very sound rule into form of a very unsound principle. His successful art makes very unsuccessful science, and all are the losers by such an unnecessary strain.

And yet these very controversies, so misunderstood, are a testimony to the close relations of principles and practice: though each may stand jealously aloof from the other when formally introduced, they are the nearest and most intimate of neighbors. The fact is that an effort at knowledge of the unwavering laws of nature is as natural as breathing, and the most narrow experience is most likely to be confounded with their discovery. A lesson of my youth at another's expense has saved me from some such blunders: A neighbor was threshing for us, in the old, unscientific way of thumping the floor with a flail, and as we turned the bundles or bound the staaw, he entertained us boys with wondrous tales of his skill in horse-breaking. He was a "scienced colt-tamer" beyond a doubt. But science unapplied we are all dissatisfied with, if we do not distrust it; and since we had the materials at hand for a test, it must be tried. The colt, a wiry, wily thoroughbred, was led into the yard, where our confident man of skill prepared to mount him. The reins were gathered as if to mount a lady's pony; there was a confident spring of the man, a single plunge of the horse, a somersault over fifteen feet of earth, and a bruised horse-tamer, stiffly picking himself up with the remark,—ever since a by-word in our family,—"Jones' colt never made no such motions as that." The colt awaited the handling of a larger experience, and science in horse-training was quietly shelved for that winter.

A more striking proof of this intimate relation of science and the arts is found in the fact that science often explains the reasons for a practical rule long after the rule has become thoroughly established on the "cut and try" method; while the arts furnish always the best of illustrations for science. This fact shows mutual relations, not independence. Suppose agriculture to be wholly "an empirical art;" that is, wrought out by experience of facts alone through all the ages since man began to till the soil and wait for the harvest. Still the principles of nature, in turning soil and seed, sunshine and shower, into produce, underlie the whole, simplifying and unifying practice whenever they can be discovered; and the abundant data of facts in these practical rules must be a part of the information out of which science is created. When both are made to unite in spirit and purpose, we may expect a more definite and clearly developed art as well as more exact science.

Such has been the tendency in other callings. The working of metals in its recent perfections combines the older arts and the newer sciences. The modern dyes and pigments are results of a similar combination. The economy of great manufactories, in which scarcely so much as the smoke is allowed to go to waste, calls in the same assistance. The grand advance in perfection of machinery is by acknowledgment of the same relationship. Even those wonders of inventive genius, which of late attract so much attention, are from the same combination.

Elisha Gray was a college-mate of mine, who earned his way more than half through college by working at his trade of joiner, showing in his scholarship a decided scientific bias. He left his course to enter a business life too limited to employ the full strength of his abilities; and so he let his mind run upon some of the wants of the telegraph, applying his scientific and mechanical skill to the catching and re-enforcing of feeble electric currents. His success in a new relay magnet put him into the employ of the Western Union Telegraph Company as inventor. What did he do? Shut himself into his workshop that he might, like the boy with the fiddle, make his machines "out of his own head"? No; he studied and wrought together, mastered the knowledge of others and experimented in the same lines,—in short, trained himself into a scientific observer in the field of galvanic electricity. After years of such work, it was an accident that revealed to him the foundation facts of telephonic action, but an accident that could not have happened to any other one not already so well versed in such matters. Then he made a study of his facts, compared them with every other known phenomenon of similar nature, and so mastered his subject that when he came to present it before Professor Tyndall, the great authority in questions pertaining to sound, he was unabashed by even the Professor's utter scepticism, for he knew how triumphantly he should meet it. Said he, when recounting this experience, "Invention requires a peculiar training in minute scientific observation. It must be made a business by itself." But, for such a business, who cannot see the need of union between art and science?

Similar to this, undoubtedly, must be the later growth in all the arts. Science extends the particulars of each and gives a firm foundation for future progress, while the arts become the main support of science in its deeper investigations. Let no artisan forget this opening for a more perfect art; nor let him demand of science more than he gives in return by a generous support and a thrifty following. Let no scientist allow his thoughts to overlook his nearest neighbor in his investigations, lest he lack the principal end and the principal means of his existence.

KANSAS has a right to celebrate and to call the world's attention to her progress in the first quarter century of her existence. Notwithstanding that her first decade was passed in turmoil and strife, she now stands in the front rank of western States. She is proud of her great railroads, spanning the State in every direction, and soon to play a most important part in the commerce of the continent. She is proud of her newspapers, which are on the most advanced plane of weekly journalism. She is proud of her schools, organized under the best system yet inaugurated and sustained by the most liberal provisions of any in the West. She is proud of her climate, which is as health-giving as any boasted clime in the land; and is free from the rigors of an arctic winter, or the heats of a torrid summer. And she is proud of her soil and agricultural wealth, which it annually produces to astonish the world. This pride is pardonable; and, more, it is praiseworthy. The same energy that made Kansas what it is agriculturally would work wonderful changes in States that have been less progressive; but she is to-day the Empire State of the New West, and has a right to rejoice.—*Kansas City Journal.*

THE INDUSTRIALIST.

SATURDAY, OCTOBER 25, 1879.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

Our Exchanges.

We are under many obligations to the press of the State for favors received in the way of exchanges. The exchange list of the INDUSTRIALIST is a large one, but none too large. We are filing these exchanges in the library, as rapidly as files can be procured, and all are eagerly read by students and Faculty. Will every editor in the State who receives this paper consider himself especially invited to X with the INDUSTRIALIST, and thereby contribute to the reading matter of our students, and thus increase the number of his readers by at least two hundred?

Meeting of Agricultural Teachers.

We have recently received communications from two gentlemen connected with Eastern agricultural colleges, in which strong grounds are taken in favor of holding, during the next summer vacation, a meeting of the professors of agriculture and horticulture of the different agricultural and industrial colleges of the country. This idea we heartily second, and suggest that some central point like Chicago or St. Louis be the place of the meeting. We can easily see that great good might come from this gathering. The teaching of the arts of agriculture and horticulture in the colleges of the country, is one of the recent things in educational history; and all that is known of this very important subject has grown out of the experience of these teachers. Let us have the convention, we say; only let it be an informal gathering, from which "papers" and long-winded speeches shall be excluded, and where the "five-minute rule" shall reign supreme.—*Prof. Shelton.*

The State Fair.

The opinion seems to be rapidly gaining ground among the people of the State, that the time has arrived for Kansas to hold a great agricultural fair, to be participated in by the people of the whole State. No one at all familiar with the wonderful agricultural resources of the State, and the great enthusiasm and State pride of its people, can doubt that we have in our midst all the elements necessary to make such an exhibition a great success. When we remember the work done by Kansas at the Centennial, and what she has since done in building up great fairs in other States, we are forced to marvel at the indifference of our people in allowing five prosperous years to pass without making an effort looking towards a distinctively Kansas exposition.

But let us have the State fair in 1880; only let it be what its name implies, a great exhibition of the industries of the State. No mere "agricultural hoss trot," with just enough of agriculture to "take the curse off," will do. It won't even answer to emulate the example of a certain association just across the State line, which appropriated $12,500 to the turf, "$199 to horticulture, and about $4,000 to all other interests." This sort of thing may do in a private or mere money-making association, and one not amenable to public opinion; but in a State fair any such policy will prove a mistake, view it from whichever standpoint you please. The life and soul of a State society is the active co-operation of all the interests of every section of the State; and this can only be secured by a just recognition of all in the premium lists and on the grounds.

Again, it may not be amiss to say that the people of the State are not particularly interested in any one locality in which to hold the fair. What will be required is some point easily accessible to all parts of the State, which can furnish ample hotel accommodations, and, above all, pleasant and roomy grounds. This last is, we apprehend, a matter of prime importance. The people will attend the next State fair in numbers that will surprise every one; and we hope that the fair will be held in grounds ample enough to furnish camping ground to the many families who will be present from the remote parts of the State.

Yes, let us have a State fair in 1880. It will advertise us; it will give us immigration; and it will give us courage, when we come to see the wonderful industrial progress of the State in the last five years, a thing which few of us can now comprehend. Only we insist that this fair shall be placed on a proper basis, and not be made a mere money-making concern, or a fair for the encouragement of professionals and the discouragement of farmers and the common folk who support fairs. The State Board of Agriculture, the State Grange, the State Horticultural Society, the Agricultural College, and all the farmers' and breeders' associations in the State, will take hold of this work with a will, if they are given the chance; and the result will be as much a surprise to ourselves as to the rest of mankind.—*Prof. Shelton.*

Abstract of Prof. Marsh's Address.

At the Saratoga meeting of the American Association for the Advancement of Science, the retiring president, Prof. O. C. Marsh, delivered an address on the "History and Methods of Paleontological Discovery." Coming from such eminent authority, it cannot be otherwise than interesting and instructive. The historical portion is a compilation of facts that are accessible to few; but he does not content himself by compiling facts. He studies relations, and traces a constant growth in knowledge on paleontology. The history of this growth is divided into four periods.

The first period dates back to the time when men first noticed fossil remains in the rocks. The principal characteristic of this period is the uncertainty regarding the nature and origin of these fossil remains. Were they veritable animal remains, or were they "sports of nature"? The period ended with the beginning of the eighteenth century. The various theories that were advanced to account for these remains are both interesting and amusing, but cannot be noticed in this abstract.

During the second period, comprising the eighteenth century, it was admitted that fossils were real organisms; but it was generally believed that they were deposited by the Mosaic deluge. Over this point, the contest was a bitter one. To illustrate the obstacles to the advancement of science, allusion is made to Buffon, who, soon after the publication of his work on natural history, "received a letter from the Faculty of Theology of Paris, stating that fourteen propositions in his work were reprehensible, and contrary to the creed of the church." Buffon was compelled to recant, and to publish the recantation in his subsequent works. Many amusing incidents and ludicrous blunders are given. During the latter portion of the eighteenth century, the belief that fossil remains were deposited by the Deluge slowly declined, and the new era gradually appeared. The progress of the century may be outlined thus: Fossils were the remains of plants and animals. They were not relics of the Mosaic deluge. Part had been deposited in fresh water, part in the sea. Some belong to a mild climate, others to a tropical one. Something, also, was known of the geological position of fossils. "The greatest advance, however, up to this time, was that men now preferred to observe rather than to believe.

The third period extends from the close of the eighteenth century to the middle of the nineteenth. Two characteristics of this period were, "the accurate determination of fossils by comparison with living forms," and "the belief that every species, recent and extinct, was a separate creation." Among the workers in this field, in the earlier portion of the epoch, Cuvier, Lamarck, and William Smith stand out in bold relief. In the latter part, a vast army of earnest workers were striving to reveal the mysteries of nature. "In the physical world, the great law of 'correlation of forces' had been announced and widely accepted; but in the organic world, the dogma of the miraculous creation of each separate species still held sway, almost as completely as when Linnæus declared [in the eighteenth century]: 'There are as many different species as there were different forms created in the beginning.' But the dawn of a new era was already breaking, and the third period of paleontology we may consider now at an end."

The fourth period of paleontological history began about twenty years ago. It is the period of the present. Its two main characteristics are the belief that "all life, living and extinct, has been evolved from simple forms," and the "accepted fact of the great antiquity of the human race." The publication of Darwin's Origin of Species revolutionized scientific thought. Lamarck proposed the theory of Evolution. Darwin changed it into a doctrine, and has shown how existing forms may have been derived from those of the past. "In the last epoch, species were represented independently by parallel lines; in the present period, they are indicated by dependent, branching lines."

Among the results in vertebrate paleontology are the tracing back of the larger mammals "through allied forms, in a closely connected series, to early tertiary times." The evolution of the horse is demonstrated by specimens now known. "The demonstration in one case stands for all. The evidence in favor of the genealogy of the horse now rests on the same foundation as the proof that any fossil bone once formed part of the skeleton of a living animal. A special creation of a single bone is as probable as the special creation of a single species." Other evidences are adduced; and the paragraph is closed by this unequivocal statement: "For such reasons, it is now regarded, among the active workers in science, as a waste of time to discuss the truth of Evolution. The battle on this point has been fought and won." The two lines of research — extinct forms and embryology — supplement each other. A review of the evidence of the antiquity of man is given. It is considered established that man existed in the tertiary period, which, according to fair estimates, would be two hundred and fifty thousand, or more, years.

The address is a concise history of the growth of the science of geology. It closes thus: "I have endeavored to define clearly the different periods in the history of paleontology. If I may venture, in conclusion, to characterize the present period, in all departments of science, its main feature would be a belief in universal laws. The reign of law, first recognized in the physical world, has now been extended to life as well. In return, life has given to inanimate nature the key to her profounder mysteries,— Evolution, which embraces the universe. What is to be the main characteristic of the next period? No one now can tell; but, if we are permitted to continue, in imagination, the rapidly-converging lines of research pursued to-day, they seem to meet at the point where organic and inorganic nature become one. That this point will yet be reached, I cannot doubt."

This Association has for its members the leading scientists of the country; and the papers read at its sessions may be considered a fair exposition of the scientific thought of the day.—*Prof. Failyer.*

A Change in Professorships.

Prof. Geo. T. Fairchild, who for many years has occupied the chair of English Literature in the Michigan State Agricultural College, has been elected president of Kansas Agricultural College. Prof. Fairchild is an able teacher and manager, and we congratulate the Kansas College on choosing so efficient a president, as well as the Professor on the recognition of his abilities. But what is gain to the Kansas institution is loss to the college in Michigan. Michigan Agricultural College has, ever since its establishment, merited and held the reputation of being the best institution of the kind in the Union; but at present it seems as though she was about to be deserted by her able professors. Only a short time ago Prof. Ingersoll, who was professor of agriculture, left for Pardue University, Indiana; now Prof. Fairchild is likely to leave; and there have been indications that others of the professors might do the same: while Prof. Shelton, of Kansas, has declined the chair of agriculture, which was offered him in Michigan. We hope that the Michigan legislature will take warning from these facts, and in the future make better provision for the college. This honorable body exhibited their skill as financiers by pinching the appropriations for the college to a pittance. The consequences were, that the State Board of Agriculture were obliged to reduce the salaries of the professors. This justly gave rise to some dissatisfaction; and other institutions, taking advantage of the opportunity, have lost no time in offering their professorships to Michigan men. To economize in this manner is of doubtful advantage to the State.—*Rural New-Yorker.*

This is high praise from a disinterested and impartial source, but we believe the facts fully warrant it. Kansas proposes to keep her Agricultural College supplied with practical men as teachers, who will graduate boys as educated farmers. The professor chosen to fill the chair of horticulture and botany is a young farmer from the vicinity of Topeka, Mr. Popenoe, who is an enthusiast in entomology, and will carry into his work the zeal which his love for the study of natural history has created. In this department we trust he may become as renowned as Prof. Cook, of the Michigan College, whose fame as a scientific apiarian is known throughout this country and Europe.

The Kansas State Agricultural College is in the hands of the farmers of the State, with a faculty that proposes to work on the new departure in education, which makes all ornamental secondary to practical and useful education. And we also trust that the legislature of this State will not be guilty of the folly which the Michigan legislature is accused of, a parsimony which cripples the means of infusing agricultural life with a higher education. The farmers of the State must see to it that the Agricultural College is fostered and strengthened for the work that its efficient corps of professors are addressing themselves to in so commendable a spirit.—*Kansas Farmer.*

DURING the past five years a great export trade with England has grown up, especially in beef, fruits, and the products of the dairy. About the first of last month, owing to the large purchases for foreign shipment, butter and cheese advanced considerably in the New York market; and since then a good article has been hard to obtain at any price. The fall shipments have only just begun; and prices may be expected to continue firm for the next two months.—*Exchange.*

THE INDUSTRIALIST.

SATURDAY, OCTOBER 25, 1879.

Instead of the usual circular or catalogue, we send the Industrialist to those desiring information about the Kansas State Agricultural College. We would call attention to the articles headed "Departments of Instruction," "Industrial Education," "Special Advantages," and "Directions to Applicants." If further information is desired, address Agricultural College, Manhattan, Kansas.

Faculty meeting on Monday at 2:30 P. M., sharp.

President Fairchild writes us that he expects to reach Manhattan about November 25th.

A considerable student force is shucking corn these days on the farm. A good yield is reported.

The name of Miss Sarah Walden was omitted last week from the list of those who stood in the first rank during the month past.

Four new students have been enrolled this week, which swells the total number to 216. The new ones are: W. A. Quayles, Shawnee county; A. F. Huse and C. W. Huse, Riley; and Lizzie Rowell, Ellis.

At their convention last week, the Republicans of Riley county nominated Prof. Lee for County Surveyor. The office was tendered him on the first ballot by a good majority, and he will undoubtedly be elected, as he deserves to be.

The Junction City *Union* was one of the very best papers in the State; and it gives us the doleful dumps to have to entertain the suspicion that it has gone the way of all flesh. At all events, it has not come to this office for about a month.

Kansas State Normal School, Emporia, Kansas. The general circular of this favorite school for the education of teachers is received. The fall term began Sept. 17th and closes Dec. 9th; the winter term begins Dec. 10th and closes March 16th. For further information, address the President, R. B. Welch, Emporia, Kansas.

We received a letter this week dated as follows: "United States Indian Service, Mescalero Indian Agency, South Fork, New Mexico." It was from Charles N. Russell, an old student, and contained one dollar in specie, for which he desires the INDUSTRIALIST. Charlie is working for the government, and prospering accordingly.

The College farm just now teaches a truth after the Kindergarten fashion. While the prairies and commons around us are about as barren of vegetation as the desert of Sahara, and have been so for a month, our twenty odd acres of orchard-grass and clover show a dense growth of the richest cattle food, and will furnish capital pasture for a month to come.

The Smith County *Pioneer* has just passed its seventh birthday, and a very vigorous seven-year-old it has grown into. We used to look to the *Pioneer* for frontier news,—for the latest Indian massacre, or the whereabouts of "Wild Bill;" but that was some two or three years ago. Now the *Pioneer* puts on metropolitan airs, and comes to us as from "one of the old-settled parts of the State."

From the great number of enquiries and applications for catalogues received at the College, it is quite evident that our present attendance, large as it is, will be greatly increased at the opening of the winter term. The fact is, the people of the State and of the West are beginning to understand that the Kansas State Agricultural College gives a thorough education, and one suited to the wants of farmers' sons and daughters.

The Hartford *Call*, Vol. 1, No. 1, is received. The *Call* is a large, handsome sheet, full of local news, and generally possessing merit sufficient to warrant the people of Lyon county in making it a fixture. We notice that the *Call* announces Charles A. Dow, one of our old students, as a candidate for the office of County Surveyor. If we should ever be tempted to climb down from the top rail of the fence, it would be to 'lectioneer for such men as Dow.

The Webster Society was called to order last Saturday evening by Vice-President Call, President Richardson being absent.

After roll-call and devotion, the expediency of the United States protective tariff was thoroughly discussed, the judges deciding in favor of protection, in spite of the frantic endeavors of this deponent. The order of extemporaneous speaking was unusually dry, after which an interesting paper was listened to by an attentive audience. Three persons were then initiated into the Society. Mr. Wood presented the Society with Edward Eggleston's Hoosier School-master. By the way, the Society is getting quite a number of "funny" books on hand, for the merriment of its members. The Society decided, a few members demurring, to accept the invitation of the Alpha Beta Society to join in celebrating their entrance upon their new "stamping ground."

The question for debate next evening is, Napoleon *vs.* Hannibal. The paper will be read in two weeks by Mr. Knaus. "A thing of beauty is a joy forever," and so thought we as we saw the stream of ladies come pouring in last evening, just as we Websters were getting our feet so that they rested easy at their usual angle. The habit of filibustering is becoming chronic in our Society, and we seriously object to it. The Society contemplates purchasing several new books. And now further this deponent saith not. WOOD.

At the Alpha Beta Society, on the 24th, our first duty was a thorough "extemporizing" on the part of all, which passed off quickly and very profitably. Under initiation of candidates, Messrs. LaMaster, Lightfoot, and Misses Strong and Vaught were initiated. Mr. Blain read an essay on "Tournaments," which was highly appreciated, after which the music quartette sang, "Moonlight on the Lake;" and we were again forcibly reminded that "music hath charms." In justice to the music committee, we say that there is not an exercise in our Society that is a source of more pleasure and profit than this.

By request of Society, Miss Sickels read a few selections from the first number of the *Gleaner*, published by Mr. F. B. Quinby and Miss Esther Evans, Dec. 3d, 1875. One of the articles read was upon the early history of our Society; and as we heard of the early struggles of the Alpha Beta founders to sustain the Society, we involuntarily compared the thriving condition of the Alpha Betas of to-day with that little band of seven in 1868. As we reflect upon our large membership and superior library, we are impressed with the truth of our motto, "Slowly but surely we progress." The debaters discussed the virtues of Elizabeth and Mary pro and con; and, although the character of each was ably defended, the judges decided that Mary had the greater power. The committee for "joint session" reported that the Webster Society had accepted our invitation, and arrangements for the programme were being made accordingly. The entertainment will be held in two weeks. After some further business, the Society adjourned; and, though we had spent but two hours in our exercises, we all parted feeling that it had been two hours pleasantly and profitably spent. M. E. S.

NATIONALIST ITEMS.

Will Campbell is clerking in McPherson.

There was a heavy frost Wednesday night, October 22d,—the first that amounted to anything this season.

The Kansas Pacific Railway has just ordered seven new Horton reclining-chair cars, and one hundred fifteen-ton coal cars.

F. W. Kroenke, who absconded from Wamego last year, has been arrested in Atlanta, Georgia, and brought back by one of Pinkerton's detectives.

There has been more building on Poyntz Avenue, during the past year, than for three or four years previous, and the boom has not yet fairly set in.

Mr. Ellicott has the genuine anthracite coal for sale, and several of our people have this fall purchased hard-coal stoves. Last winter was the first season this coal was used as far west as this point.

Last year some coarse gravel from the river bed was spread on a portion of Poyntz Avenue between Third and Fourth streets. It is now packed hard, and makes the best road-bed in the city,—as firm as the macadamized portion and smoother.

DIRECTIONS TO APPLICANTS.

TERMS OF ADMISSION.

Candidates for admission must be fourteen years of age, and pass a satisfactory examination in reading; arithmetic, through decimal fractions; and English grammar, to syntax. Classes are started at the beginning of each year in Drill in Arithmetic and Drill in English; and the pupil must have the knowledge above indicated, else he will be unable to retain position if admitted.

Pupils will be received at any time during the year, if able to pass an additional examination upon the subjects studied by the classes which they expect to enter. But they will find it greatly to their advantage to be present at the opening of each term, or as soon thereafter as posssble.

GRADES.

Both the Literary and Industrial recitations are graded daily upon a scale of 100; and an examination of all classes is made at the close of each month. A student not attaining an average grade of sixty is promptly dropped to a lower class, or excluded from the Institution until able to do so. The work of grading is strict and uniform in all the departments, and this process is rigorously used for sifting out incompetent and indolent pupils; thus more than accomplishing all that is designed to be effected by a "high standard of admission." Hence, the student's continuance in the College wholly depends upon his own action.

The course is based upon the determination to make the labor required in the preparation of one industrial and three literary recitations as much as the average student can perfectly perform, in ten hours a day. We design to give the pupil the worth of the time expended at College; and, in order thereto, he must do a full day's work with brain or hand. Only those students who can maintain a standing of ninety in each study will be allowed to take more than the prescribed number of recitations; and no one will be permitted to have less than one industrial and three literary recitations.

RELIGIOUS.

Unless otherwise directed by parents, students are required to attend chapel at 8:30 A. M. on academic days, and divine service once every Sabbath.

EXPENSES.

There are no charges whatever for enrollment, attendance or instruction in the regular courses; nor are there any "contingent fees" for the repair of buildings, for the use of books or apparatus, for diplomas, or the kindred privileges usually grouped under the term "contingent." Male students are furnished instruction, the use of apparatus, instruments or tools, in both the literary and industrial classes marked out for them, without any charge. And the same is true of female students in the regular classes provided for them. Printing and Telegraphy are industrials primarily provided for the education of female students, and male students taking either of these are charged $1 per month for use of instruments.

Instrumental music is a fine art or "accomplishment," rather than a mechanical art. We do not place it among our "industrials" in the same sense, or for the same purpose, that we do those provided for teaching the trades. Accordingly, the following fee is required from female students for tuition and the use of instruments:

Terms per week:

Private lessons, 2 a week, on any instrument, $1.00
Private lessons, 1 a week, on any instrument, .60
Class lessons, 2 a week, on any instrument, .65

Instruction in harmony, etc., etc., from ten to fifty cents per week, as the student may or may not be in other classes.

The only charge made for material in either the literary or industrial departments is for the chemicals used by students in laboratory practice, which are furnished at wholesale prices, and amount to but a small sum.

Furnishing an absolutely free education is as much as can be reasonably asked; and the Institution neither boards, clothes, nor supplies the student with text-books. Boarding can be obtained in private families at from $2.75 to $4 per week. Washing costs from seventy-five cents to one dollar per dozen. Text-books, which can be procured in Manhattan, cost from $2 to $5 per term.

No student need expend over $5 per week; and many of our best pupils are living at $1.25 per week. Students desiring to "board themselves" can do so at from $1 to $2 per week. In a club of four young men, renting a house, the average cost to each for the term was $1.11 per week.

LABOR.

Manual labor by the students may be for either of two purposes: First, to acquire skill in a given art; second, to earn money. In the first case, the labor is educational; in the second, it should be paid for by the party benefited.

Educational Labor.—Manual labor in the reciations of the Industrial Departments, like mental labor in those of the Literary Departments, is purely educational and will not be remunerated. While the interest of the student will be held paramount in the direction of this labor, the practice necessary to dexterity will be required.

Remunerated Labor.—When the Institution needs labor on the Farm or elsewhere which is not educational, but simply for its own profit, and which a student is able and willing to perform, it becomes an employer instead of a teacher, and he an employe instead of a scholar. It pays for work, he works for pay. The relation between them is commercial, not educational; and both parties must act upon business principles. Hence, the College furnishes only such employment as its own interests require, and will pay according to the value of the service rendered at from seven to ten cents an hour.

AMOUNT EARNED.

It is impossible to predict how much a given person can earn, since that depends upon what he can do and what work there is to be done. Hence, it is wholly impossible for us to answer the question so often asked: "Do you think I can meet my expenses by work?" Some students make one-half their expenses, some the whole, and exceptional men have made more than expenses. As a rule, a faithful boy skilled in farm work can earn half his expenses on the Farm or in the Nursery. During the year he can ordinarily acquire sufficient skill in the wood or iron shops to enable him to make articles for sale. The whole question is one for his own consideration and decision. We can teach all who come, but cannot absolutely *promise* anything more. Hitherto we have refrained from holding out strong inducements respecting the amount of labor we might have to offer; but in view of the fact that during each of the last three years we have had more to do than the students could perform, we are inclined to give greater and positive encouragement on this point. Any boy who is in dead earnest, who is familiar with farm operations, and who can raise $50 to start with, should be able to carry himself through the four years' course. And certainly this places an education within the reach of every determined boy. As yet we are unable to offer similar advantages to girls, not requiring labor in the College departments which they can perform.

RULES.

1. Behave as a true man or woman should, at all times and in all places.

2. Attend to your own business promptly, thoroughly and courteously; and vigorously let alone that of other people.

3. Penalty: "Leave!"

PUBLICATIONS.

THE INDUSTRIALIST, a weekly journal edited by the Faculty and published by the Printing Department, contains original and seasonable articles on the Farm, Orchard, Trades, Sciences, and Education. Price, 75 cents a year. Address A. A. Stewart, Manhattan.

CALENDAR.

Fall Term, 1879.—Began Wednesday, September 10th, 1879, and will close December 18th, 1879.

TO NEW STUDENTS.

Bring the text-books you have been using. On arrival, first arrange for your boarding. A. A. Stewart will furnish information, either by letter or on application, concerning boarding places or rooms for rent. Report to the President at 8:30 A. M., immediately after chapel exercises, for enrollment.

For further information apply to M. L. Ward, President *pro tem*, Manhattan, Kansas.

LITERARY SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in the College Chapel every Friday at 2 P. M. Ladies admitted. New students cordially invited to attend. GEORGE ROSE, President.
MISS ROWENA WHALEY, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Telegraph Hall every Saturday evening. Visitors, especially students, always welcome.
NOBLE A. RICHARDSON, President.
GEORGE F. THOMPSON, Secretary.

RAILROAD TIME-TABLE.

KANSAS PACIFIC RAILWAY.

PASSENGER ARRIVES.

No. 2, going East..... 11:58 A. M.
No. 4, going East..... 3:28 A. M.
No. 1, going West..... 4:03 P. M.
No. 3, going West..... 4:51 A. M.
No. 7 (freight), going West..... 8:45 A. M.

Nos. 1, 2 and 7 run daily. No. 3 runs daily except Monday. No. 4 runs daily except Sunday. Passengers with tickets are carried on No. 7.
GEO. C. WILDER, Agent.

THE INDUSTRIALIST.

SATURDAY, OCTOBER 25, 1879.

Industrial Education.

The real value of an education to the student depends upon two things: First, the practical worth of the knowledge taught; and, second, the degree in which he makes it his own. Hence, the ability of any institution to give a practical education depends upon the kind and aim of the knowledge it teaches, and upon the thoroughness of the instruction therein. The State Agricultural College was directly endowed by Congress, and is guided by the State, for the specific purpose of furnishing to the industrial classes of Kansas a "practical" education, that is, "one fit for use." As its name indicates, and as the statistics of the industries of the State require, its chief work must be that of giving a useful and usable education to those who will engage in farming; and, therefore, the Farmer's Course must, from the nature of the case, be its main one.

FARMER'S EDUCATION.

Words and figures are merely instruments with which to record ideas. They are not themselves ideas, nor should they be made the chief end of an education. As a wagon is necessary to haul grain, so are they a necessary part of an education; but as the wagon is not the grain, so they are not the knowledge which the farmer converts into money. Hence, the classics and higher mathematics are not taught. But it will be noticed in the following course that so soon as the pupil acquires working skill in the use of the English language as a tool, and of figures and lines as mathematical tools, those arts and sciences which present knowledge that has a cash value to the farmer are taught as rapidly as their importance and thorough acquisition will permit. Studies numbered (1) and (4) in the second, third and fourth years are the spine of the course, to which the others are as ribs and muscle.

FARMER'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Practical Agriculture (advanced.)		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	
3. Polit. Economy, Practical Law.		3. Practical Geometry.		3. Algebra.		3. Industrial Drawing.	
4. Zoology.		4. Horticul., Landscape Gardening.		4. Practical Agricul. (elementary).		4. English Structure.	
5. Agricul. Chemistry	Meteorology.	5. Organic, Analytical Chemistry.		5. Physics.		5. Adv'd Arithmetic, Book-keeping.	
6. Logic.		6. Practical Surveying.		6. Industrial Drawing.		6. U.S. History, Industrial Drawing.	

WOMAN'S EDUCATION.

Nearly one-half of our students are females, and the Woman's Course is prepared expressly for their liberal and practical education. We have no doubt whatever that practical men and women, who understand what it means and what it seeks to do, will fully endorse it.

WOMAN'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Farm Economy, Special Hygiene.		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	
3. Polit'l Economy, Practical Law.		3. Industrial Drawing.		3. Algebra.		3. Industrial Drawing.	
4. Zoology.		4. Horticul., Landscape Gardening.		4. English Literature.		4. English Structure.	
5. Phys'c'l Geography,	Meteorology.	5. Organic, Household Chemistry.		5. Physics.		5. Adv'd Arith., Book-keeping.	
6. Logic.		6. Household Economy.		6. Industrial Drawing.		6. U.S. History, Industrial Drawing.	

MECHANIC'S EDUCATION.

Because of the adaptedness of the leading course to the wants of the intelligent mechanic, it has been found practically unnecessary to diverge from the Farmer's Course. Additional studies, specially adapted to the mechanic's use, will be furnished in a Post-Graduate's Course.

If it be urged that the distinctively agricultural knowledge taught in the Farmer's Course is not directly valuable to the mechanic, we reply that, admitting the point for the purpose of argument, yet: 1. This knowledge is of more practical value to the mechanic than is the Latin, Greek, or a half dozen other things embraced in the usual course preparatory to the professions; 2. That the great majority of Kansas mechanics will also be more or less engaged in agriculture; 3. That those studies in the course which are directly valuable to the mechanic, together with the shop facilities, offer a better mechanic's education than can be elsewhere found west of the Alleghanies.

INDUSTRIAL DEPARTMENTS.

Having knowledge in the head is one thing; ability to use it with the tongue, fingers or feet is quite another thing. Both are vital to success in practical life. A man might thoroughly understand the theoretical principles of carpentry, and yet, not having used the tools, be wholly unable to earn carpenter's wages. So in all other vocations. Accordingly, instruction is given in the following well-equipped Industrial Departments, and every student is required to recite in some one of them, as selected by the pupil or parent:

FOR MALE STUDENTS.	FOR FEMALE STUDENTS.
The Farm.	Dress-making.
The Nursery.	Printing.
Carpentry.	Telegraphy.
Cabinet-making.	Scroll-sawing.
Turning.	Carving.
Wagon-making.	Engraving.
Painting.	Photography.
Blacksmithing.	Instrumental Music.

Each of these departments is conducted exactly as in daily life, and aims to give precisely the drill received by an apprentice. No charge is made, either for tuition or material, from male students taking the Industrials provided for them; nor from female students taking the ones provided for them, except in Instrumental Music. Male students taking either Printing or Telegraphy are charged $1.00 per month for the use of instruments and material.

DEPARTMENTS OF INSTRUCTION.

DEPARTMENT OF AGRICULTURE.

PRACTICAL AGRICULTURE.

Second Year:—General principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage.

Fourth Year: General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of a rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farmhouses; barns.

FARM ECONOMY.

Woman's Course, Fourth Year: Dairy products as human food; influences affecting character of milk; manufacture of condensed milk; the factory system and household plan of cheese-making; treatment of rennet; general process of cheese manufacture; subsequent treatment of cheese; butter-making; creameries; "deep" and "shallow" setting systems; general process of butter-making; packing and preserving butter.

DEPARTMENT OF BOTANY AND PRACTICAL HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest; also a course of lectures on Landscape Gardening. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard; fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture; shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in in the work of laying out and plotting grounds topographically.

CHEMICAL DEPARTMENT.

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life. Text-book, Ganot.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blowpipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

Are constantly in progress in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

DRILL IN ENGLISH.

"As grammar was made after language, so ought it to be taught after language."—*Herbert Spencer.*

Drill in English embraces the following topics:

Sounds of the language; drill in producing the vocal, sub-vocal and aspirate elements with accuracy, distinctness and volume; vowels, consonants.

Letters: Form; power; rules for spelling, drill.

Words: Signification, properties, modifications, variations, relation and dependence.

Sentences: Drill in statement of ideas; description, clearness, terseness, vigor; business letters, discussion; capitalization; syllabication; punctuation; construction and analysis of sentences; elements, uses and names; criticism of compositions printed as written; proof reading; grammatical construction; superfluous words and clauses; drill in reading, speaking and penmanship.

Text-books: Webster's Academic Dictionary; Lee & Hadley's Advanced Lessons in Language.

Pupils deficient in spelling, etc., should enter the printing class, the printing-office being the work-shop of language.

STRUCTURE OF ENGLISH.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

MATHEMATICAL DEPARTMENT.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

DRILL IN ARITHMETIC.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Following this line, the student, so far from hammering away at "pure" science draws from the mathematical store-house what he needs, and sees why he needs it. Accuracy of calculation and posting, rather than a *mere* comprehension of the principles, is aimed at. Besides the recitation-room drill in business forms, practice in the field is also given. Estimating the number of cords in a pile of wood said to be 100x4x4 feet is one thing; measuring a pile of wood through which any number of cats may be harmlessly thrown, and in which four-feet sticks are the exception, is quite another and more difficult thing.

ARITHMETIC AND BOOK-KEEPING

Is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides ensuring arithmetical practice, develops practical skill in that important art.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admiral system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study. In addition, constant practice in the application of lines to metal and wood is furnished in the Blacksmith, Carpenter, Turning, Scroll-sawing, Carving, Engraving and Printing shops, and to fabrics in the Sewing Department.

PRACTICAL GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the use of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

PRACTICAL SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

STUDIES SPECIAL TO WOMAN.

Besides the studies already indicated, attention is called to the following:

SPECIAL HYGIENE.

As shown in the course, one term is devoted to the study of Physiology, from the text-book of Dr. J. C. Dalton. This is followed in the fourth year by a course of lectures to young ladies by Mrs. Cripps on the subject of Hygiene, embracing such instruction in hygienic matters as are valuable to woman.

FARM ECONOMY considers those affairs of the farm which usually come under the supervision of the farmer's wife or daughter, and which are not included in "gardening" or "household economy;" such as butter and cheese-making, dairy management, etc. A course of lectures is delivered by the Professor of Practical Agriculture. See heading, "Farm Economy."

GARDENING is included in Practical Horticulture. See heading, "Landscape Gardening."

HOUSEHOLD CHEMISTRY. See heading, "Household Chemistry."

HOUSEHOLD ECONOMY

Follows Household Chemistry and consists of lectures by Mrs. Cripps on the art of house-keeping, embracing cookery, domestic management, and kindred topics. Many elderly gentlemen sufficiently know, and more young gentlemen will duly discover, that systematic knowledge of how cooking ought to be done is luminously different from the ability to do it. Instruction without practice can effect but little. Accordingly, a kitchen laboratory has been completely furnished, and affords every facility for drill in the art of cooking. This drill chiefly differs from that of a kitchen in the respect that after a girl has learned to wash dishes or pare potatoes she is not kept everlastingly at either. After full trial, we have found it just as feasible to give this practice, with profit and pleasure to the pupil, as it is to give laboratory practice in chemistry,—and no more expensive.

Printing!—Daily instruction and drill in the work of a First-Class Printer. The Literary Departments offer a thorough education in the construction and use of the English Language, as employed by the Proof-Reader; in Book-Keeping; and in Industrial Drawing, as the best developer of that taste necessarily exercised by every good Job Printer. The Printing Department is well furnished with all the facilities for a speedy mastery of the art of Printing, and is in charge of a practical printer. Besides regular class instruction in printing, the weekly publication of the INDUSTRIALIST by the Department furnishes advanced students the requisite drill in newspaper work.

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A Great Philological Discovery.

Rudolph Falb, a German professor, recently arrived in San Francisco, after spending two years in South America, and now on his way back to his native country, authorizes us to announce that he has made discoveries of great interest to ethnology and philology. While in Bolivia, he studied the Aymara tongue, which was in use before the Spanish Conquest, and is older than the Quichua, which was spoken by the Incas and their subjects in Peru. This Aymara language, still spoken by 8,000,000 people of the aboriginal blood, bears an unmistakable and near affinity to the Semitic tongue, in which the radical form of every verb has three consonants. The Arabic and Hebrew are the leading languages in this class; and the relationship of the Aymara to them is strong and unquestionable throughout.

If this discovery should prove to be well founded, it will have an immense influence on the opinions of the learned world. Some of the most interesting researches of the present century have been made in the same direction. The discoveries that the Sanscrit, Hindostanee, Persian, Afghan, Armenian, Caucasian, Slavonic, Teutonic, Celtic, Latin, and Greek tongues all belong to the inflected class of languages; that many of their principal words, such as father, mother, brother, horse, ox, fire, sun, sky, light, dark, come, go, see, here, eye, ear, hand, mouth, and so on, have similar sounds in these different tongues; and that ideas of later origin, connected with a high degree of civilization, such as pen, ink, paper, gun, pistol, and so on, are different,—these discoveries have proved that the Aryan nations, as they are called, all sprang from a common stock in Central Asia, whence most of them migrated to Europe. By examining the Sanscrit, the oldest of these tongues, and comparing it with the others, we can tell much of the intellectual, industrial, political, and social condition of the early progenitors of these people, which races first left the common stock, and how much progress was made before the separation. The word for daughter—differing little from the English and German words—in the Sanscrit means milkmaid; and, therefore, while the ancestors of the Germans were still living with the ancestors of the Hindoos, in Asia, they had cows. By the same method of reasoning, we know that they had plows; that they had religious ideas and forms of worship; that they had political rulers, military training, and so on. We know, further, that the people who speak the agglutinative languages, like Magyars Turks and Tartars, and the monosyllabic languages, like the Chinese, are of a different blood. Ethnologically, the Semitic races—the Phœnicians, Hebrews, and Arabs—are clearly distinct from the agglutinative stock; but whether they are to be classed as belonging to the same blood with Aryans is a question about which philologists and ethuologists are not agreed.

If now the Aymara is a Semitic tongue, the learned world will have a hard task to determine whether Asia or South America was its original seat, and how the transfer was made without leaving any large mass of its active and imperious blood on the long road. Was the high plateau of South America the cradle of the Semitic, as that of Asia was the original home of the Aryan kindred? If we understand Prof. Falb correctly, he would answer that question in the affirmative; and, if he establishes his point, we do not hesitate to say that he will take a place among the greatest discoverers and stimulatosr of thought and research in our age of unparalleled and unapproached intellectual activity. There may be no money in it; but there is an immense educating and refining influence in tracing back the history of man through the different steps of his natural progress from the lowest condition of savagism in the Stone Age, before he had yet learned to make metallic tools, to his present enlightenment. Four miles south of Lake Titicaca, 13,000 feet above the sea, in Bolivia, is the ruin of Aymara temple, with a large stone covered with carved hieroglyphs or figures. These hieroglyphs Prof. Falb claims to have interpreted; and he finds in them the proof that this temple was erected as a memorial of a great flood. One of its principal figures contains Masonic signs, which mean the light, the thought, the word, the beginning; and the signification and history of these signs, after having been lost for thousands of years, are now again to be brought within the general comprehension. Figures, used as religious symbols in very remote days, were preserved long after some of their meanings were forgotten. The philological world will look with interest for Prof. Falb's revelations.—*San Francisco Alta.*

Improving Seed by Selection.

Probably not one farmer in one hundred appreciates the importance of selection of good seed, as a means of improving and increasing the yield of crops. Gardeners understand this better; and yet they, as a class, do not pay the attention to this matter that it deserves. Florists understand this still better than the vegetable gardener, and yet not more than one-half of this class appreciate this matter as it should be. In fact, few do, except experimentalists who have made vegetable physiology a life study. While it is true that the soil has the most important part to play in the production of crops of any kind, in connection with good cultivation, yet given these, the highest results cannot be reached, except in connection with the most careful selection of the best and heaviest seed. This is one reason why those who pay careful attention to such matters ask and get higher prices for their seeds.

The breeding up of a plant, like that of a high-bred animal, costs years of time and careful cultivation. If once a plant is established as to its superiority, it may be kept so, and even in many cases improved, by careful selection. If it be given only ordinary care, if weeds be allowed to choke the crop, it will retrograde much faster than it was brought up. Hence the constant sale that is found each year for new and superior seeds; the new because they are new, and the superior seed because they have been bred and selected with patience and care. Any person may do this, if he will only spend the necessary time; and that it will pay is patent, from the fact that, year by year, these extra seeds are bought and paid for at large prices by practical gardeners, who find it cheaper to buy than to save for themselves. A short time since, a gentleman, for many years connected with the government gardens in Washington, related a circumstance that came under his special notice, he having been consulted in regard to buying a quantity of cabbage seed, one lot at $3 and the other at $9 per pound. He advised buying the high-priced seed. "Nonsense," said the official who asked the advice, "cabbage is cabbage, and the cheap seed is as good to give away as the dearer." The cheap seed was bought for distribution; and our friend had the curiosity to procure a lot from both. The result was that the high-priced seed gave ninety per cent of well-headed cabbages, and the ordinary only forty cent of good, sound heads.

It is hardly necessary for us to pursue the comparisons further. Yet we suppose the average cultivator will go on, year after year, saving just such seed as he may be able to gather from plants that have gone naturally to seed, the refuse of the field, and wonder why plants run out so quickly. Such men believe firmly in the necessity of changing their seed. Well they may. As a rule, in from three to five years they will so deplete the yield by sowing inferior seed that they are obliged to change, when if they had used ordinary care in selection, with good cultivation, they might have kept their yield intact. The good cultivator need never change his seed, so long as he exercises care in selection, and gives his crops careful cultivation.—*Prairie Farmer.*

Too Much Study.

In the East, the question of too many studies with too little of good results in the public schools, is again coming into prominent notice. It is a subject which will be agitated until some radical and important changes are made. Too much grammar and parsing, with too little improvement in speech and composition; too many beautiful, mechanical, military methods, which please the superficial observer; too much declamation at the expense of more essential school work; and too much time and attention given to splendid examinations fixed up by the teacher, with shallow exhibitions,—are now being severely denounced by leading scholars of the East. Boston and vicinity are taking the lead in trying to effect a reform.

Severe grading, which keeps pupils within the traces, allowing not enough of progress on the part of some, while too rapidly pushing forward others, is one difficulty to be overcome. An effort is made to allow more of individuality in the pupil's course.

To be able to read well, to write readily and grammatically, and to be master of good, easy English in ordinary conversation, without stiffness on the one hand or the use of vulgarism and slang on the other, are necessary qualifications of the teacher now required, and spelling is of course included. The prime results in their schools must be, on the part of the pupils, a gradual acquisition of the same, with other branches to follow. But half a dozen studies at once are not to be thought of. A wise system of doubling up, however, saves much time. For example, in a history class, reading, writing, composition, spelling, geography, and possibly more branches, may be taught at the same time.

Many teachers have long deplored the fact that they are required by public opinion to work by methods which at heart they cannot approve. People often complain because their children are not crowded enough. If at the examination they cannot make a good display, another teacher is employed who better understands how to tickle the parents; and the former teacher begins to despise the work required of the profession. There are two sides to the question. Many a teacher says, "Were this school mine for a term of years, and had I the liberty to teach as if they were my own children, I would work on a very different plan. But here I am, and must do about as others have done." While the children are overcrowded with studies and hampered with severe grading, the teachers also are overworked, and are often heartsick at the sight of from fifty to a hundred children penned up in a room, cramped and warped, mentally and physically, and injured in their growth instead of being developed by nature's own steady, healthy processes. Much has been said, much should and will be said, on this most important question, a question vital to the stability and progress of society and of the nation. Charles Francis Adams, Jr., in a pamphlet, the New York *Tribune*, and other leading papers, are taking hold of the subject in earnest.—*Wyandotte Gazette.*

THE INDUSTRIALIST.

SATURDAY, NOVEMBER 1, 1879.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

Chemistry of Cooking Meat.

In roasting, the heat first coagulates the albumen and gelatine of the meat, preventing their escape except in small quantity. The heat slowly penetrates the interior. Unless the roasting be continued sufficiently long, the parts nearest the center will not be hot enough to coagulate the albumen, and the meat will be red, juicy and underdone. It is obvious that the roast should be exposed to a good roasting heat from the first. By this means, the greater portion of the juices is retained within the meat.

In boiling, the result is somewhat different. If the flesh be placed in cold water and the temperature raised gradually, the soluble albumen, the soluble salts, and the flavoring portions,—all of which are soluble,—begin to pass out into the water, and the meat gradually becomes impoverished, while the liquid in which it is boiled becomes correspondingly rich and nutritive. In order to preserve the full flavor and quality of the meat, the water must be boiling before the joint is put in, and maintained at a gentle simmer until the whole of the meat has attained a temperature of at least one hundred and seventy degrees. By this method the albumen in the exterior portions is coagulated as soon as it comes in contact with the water, and prevents the escape of the soluble portions within. The meat is vastly richer and more palatable, but the broth suffers proportionately. We can take advantage of these facts according as we wish to have the strength in the broth,—as in beef-tea,—or in the flesh itself. The brown color which boiling often gives soups does not add to their flavor, as is generally supposed. By custom this dark color is associated with the idea of strength and flavor. This color is sometimes given to broth by the addition of a little burnt sugar. When salt is added to fresh meat, the juices ooze out to form a brine, and, of course, are lost to the meat. To avoid impoverishing the meat, salt should not be added until the flesh is partially cooked. These principles are perhaps more generally known than employed in practice.—*Prof. Failyer.*

6:19.

Below we give an extract from a work on the "Squaring of the Circle," by John Davis, of New Hampshire. John has solved the problem. Diameter and circumference are commensurable now, their ratio being as 6 to 19. His book is, however, more interesting than other "perpetual motion concerns," as it presupposes that the Bible contains every great truth worth knowing; and, as a consequence, extracts the necessary demonstrations from the holy pages. We quote the following as an example:

"You may observe my ratio to measure a circle (which is a true figure of eternity) would naturally end with a 6; and thus you see a true ratio never could have been fouud by the natural use of mathematics. In the Revelation of St. John, you find that, after the 7th seal, the world is measured to its end by six trumpets. Now, under six trumpets you find the four angels loosed from the great river Euphrates, by whose army the greater part of men were slain. This army was computed at 200,000,000. The oath in chapter 10 was, that when the 7th trumpet began to sound, the end of the world should come; so you see it lasts but through the 6. And in the 13th chapter you find, under the reign of the great beast, that no one had liberty to buy or sell except he had the mark of the beast, or the number of his name. Let him that hath understanding count his number; and his number is 666. Now, it goes by thirds, as you may see by reading; as 3 times 3 are 9, and 666 multiplied by 9 is to the square equal to 5,994. This makes it lack 6 of making the 6,000 years. In the 24th chapter of Matthew, our Savior says, 'Except these days be shortened, no flesh shall be saved.' Now, the number of the beast falls short of 6,000 by 6 years; so it appears that the time has been shortened 6 years; and you see that 6 is the number that governs all these operations; and it is evident that great operations can be performed with it."

We can hardly suppress a smile over such a mathematical demonstration, yet John is not alone in chasing shadows and phantoms. His logic is no worse than that of the great majority. He was unfortunate only to get lost on the strange field of mathematics, instead of staying in his home parish. Greater men than he reasoned as he did. Dean Cockburn declared geology to be a study invented by the devil, and unlawful for christians. Martin Luther thought Copernicus a blasphemer for his new idea that the earth revolves about the sun, not the sun about the earth. The majority of philosophers of the scholastic period held the new idea of the rotundity of the earth incompatible with salvation; and so agree the majority of Johns to-day that evolution is not in accordance with the Holy Scriptures, and therefore not a fact. The majority choose the propositions which they adopt just as arbitrarily as John did his; and to them the words truth and falsehood only emphasize the expression of their determination to hold to their choice.—*Prof. Walters.*

Mind and Body.

Baron Oxenstiern, the Swedish Chancellor, passed the last week of his life on the mountain farm of his brother. One evening the brothers were sitting on a rustic bench, in the edge of a mountain lawn, where the boys of the farmer were disporting themselves,—running races and shouting in the joy of health. While the Chancellor watched their sports, a vision was haunting his soul,—the dreary University of Upsala and two pale-faced students. Staggering suddenly to his feet, he drew a dagger and handed it to his brother, with the words: "Cut my throat, Hendrick: I cannot stand that any longer. How can I answer for the earthly paradise my sons have lost through my fault? What have I robbed them of?"

How many fathers might accuse themselves, like that gloomy ascetic, of having sent their sons to college, fresh and vigorous, with the roses of health upon their cheeks, to receive them back as dyspeptic or consumptive invalids. Is it a wonder that so many decline to buy the diploma at this price? The exclusive training of the mind, the rule in most colleges, is only too often sapping the physical system, robbing those, who should have been benefited, of their future usefulness, and their present and future happiness.

There are some educators who persist in the belief that the Creator approves the marring of his image; and "that a sickly, whining wretch, who fears to walk upright or raise his eyes lest the Deity might be offended at his want of humble contrition, is a more pleasing sight in the eyes of God than a man like Milo, who walked the earth with the gait of one who has not known defeat." Others are so interested in the training of the mind that they do not find time to see after the body. Others are careless; while most educators, perhaps, fail by assuming that nature will help itself, and that the bodies of our sons and daughters need no special attention, exercise and training.

It is a consideration of no small weight in favor of agricultural colleges that they exercise the body as well as the mind; that they encourage healthy, outdoor labor, while, at the same time, they afford instruction in the ordinary branches of science and literature, thus blending intellectual and physical culture.

It is true that "mind rules the world," yet what is mind without muscle? Was it mind only that conquered Napoleon III. at Gravelotte and Sedan, or Lee on the battle-fields of Virginia? Was it mind only that freed our country from foreign tyranny? What would have availed the power of Gaths and Vandals against the Romans, in the days of Augustus, when temperance and the manly arts were taught at home and abroad? Do we heed these lessons of history sufficiently in our national education?—*Prof. Walters.*

Good Manners.

In this fast age, young America is developed in a very high degree. He thinks he is a litte bigger than his father, and is sure that he knows a great deal more. He therefore pays but little respect to the old gentleman, either as it regards his presence or his opinions. He also forms the habit of treating others, who may be his superiors, with the same disregard. In meeting them, he has no appropriate salutation to offer; and in speaking of them is sure to omit any title of respect which may justly belong to them. Possibly he has never been instructed in the elements of good breeding. He enters the sitting-room without removing his hat, leans his chair back on its hind legs at an angle of sixty degrees, and places his pedal extremities on the table. Perhaps he uses slang and smokes a cigar, even in the presence of ladies; and, if asked a question, his reply would be, "Hay?" Now, whether these actions, and others of a similar nature, occur from ignorance or carelessness, they should be earnestly avoided.

Good manners may be defined to be words and actions that are pleasing to others. They are some of the marks which distinguish a civilized from a savage or barbarous race of beings, which distinguish the refined and cultured from the coarse and ignorant. I do not mean that shoddy drawing-room etiquette which means just the opposite from what it says; which makes a bow according to a prescribed rule, without having any heart in it; which is ever so glad to see you, when it really wishes you forty miles away; and urges you to call again, when in fact it hopes you will never darken the door. Away with such bosh as that! But I mean those actions and words which spring from a cultured mind that is really desirous of making others comfortable and happy, and does not think more highly of itself than it ought to think. It is beautifully summed up in the golden rule, "As ye would that men should do unto you, do ye even so to them." Grace in action, ease and beauty of expression, are, of course, factors in the case; and these are to be studied. Much is implied in those few Bible words,—"in honor, preferring one another."

Those much older than ourselves are entitled to a certain deference above that which is due to one of the same age. Ladies, in this enlightened day, as members of the gentler sex, are worthy of a certain regard by the gentlemen, in some respects different from that which they should show to one of their own sex; and it is surely highly proper that we should treat a superior, either in knowledge or position, with a respect above that which we owe to an equal. I admire that feeling in the heart of a student that prompts him to meet his Professor with a respectful salutation; and to hear him speak of his instructor in words which show that he has a regard for him as a superior. It sounds much better than to hear him mention his President as "the old Prex." There are a thousand little ways in which we can show this regard for one another. A pleasant "good morning," on meeting any member of the family for the first time each day, sounds well. It is cheery: it makes one feel better for the whole day. By remembering and performing these little forms of regard, we really cultivate the true feeling of respect in our hearts; and by neglecting them, we rather smother and destroy respect.

Good manners are not only valuable in promoting the happiness of those with whom we associate, but they gain for us the favorable opinion of others. Every one likes to obtain the respect of others, and in no surer way can he do this than by genuine politeness. This trait of character has, also, a money value; for, if one is truly polite, he is more likely to receive a situation or to retain one at better wages than he could do if he lacked this quality. Let us then cultivate good manners; and, especially, let us not fail to show a proper respect to the Creator of all things, as our great superior.—*Prof. Platt.*

THE INDUSTRIALIST.

SATURDAY, NOVEMBER 1, 1879.

Instead of the usual circular or catalogue, we send the Industrialist to those desiring information about the Kansas State Agricultural College. We would call attention to the articles headed "Departments of Instruction," "Industrial Education," "Special Advantages," and "Directions to Applicants." If further information is desired, address Agricultural College, Manhattan, Kansas.

The cold, north winds of the past week have made fires the centres of attraction.

Prof. Ward went down to Topeka Tuesday to attend the Baptist State Convention. He returned Wednesday morning.

Another old student has gone the way of the world. His name is Quinby, and they call him Frank for short. He was married some weeks ago, but has succeeded in keeping the matter remarkably quiet.

A valuable addition has lately been made to the College library. We refer to the purchase of the last edition of the Encyclopedia Britanica. The first ten volumes have been placed on the shelves, and the others will soon be procured.

The Central Kansas Stock Breeders' Association will hold its first meeting, for the fall of 1879, this afternoon, at 2 P. M., in Prof. Shelton's lecture-room. It is expected that a number of the prominent stockmen of this section will be present.

Ex-President Anderson made a hasty visit to the Hill yesterday. He has just returned from the northwest part of the State, and says the country out there is lovely. Mr. Anderson promised to make us a longer visit before going to Washington.

A letter from N. H. Gentry, of Sedalia, Mo., informs us that British Sovereign II., a boar which he purchased from the College, "had been shown at three fairs this fall, and won six first premiums, including the first in his class and the general sweepstakes at the great St. Louis Fair."

The November number of the Kansas City *Review* contains more than its usual quota of first-class original articles, besides a large number of very excellent selections from other periodicals, geographical items, astronomical notes, editorial items, etc. Sixty-four pages octavo, $2.50.

The Board of Regents, at its last meeting, provided for the re-arranging of one of the large rooms in the "old barn," so that it would be suitable for a Society Hall. Accordingly, the room has been furnished with new seats, a platform erected, and the place otherwise much improved.

The Kansas Academy of Science will hold its twelfth annual meeting in Topeka, on Thursday and Friday next, Nov. 6th and 7th. Profs. Popenoe, Failyer and Graham will represent this Institution at the meeting. In the selection of its officers, the Society has rather favored Manhattan. Its President and Secretary, Profs. Mudge and Popenoe, are both residents of this city.

In accordance with an action of the Board of Regents, Prof. Walters has lately purchased a number of books of reference for his department. Among them are Woodward's National Architect, in two volumes, and three works on stair-building, topographical drawing, and barns and outhouses. Other additions are being made to the Department of Industrial Drawing which, with these books, will greatly improve its facilities for teaching all branches of this important art.

Grace Young 4th, one of the Short-horn cows belonging to the College herd, is quite a remarkable animal. We have had occasion several times in the past to notice some of her superior qualities. This time she comes to the front as an example of what the tame grasses are capable of doing as exclusive food for stock. Grace has eaten no grain for over a year, but has been kept on the grass in the meadow, or on the hay in the manger. Yesterday she was placed upon the scales and tipped the beam at just 1,705 pounds. This is an argument for the Short-horns as well as the tame grasses.

The Alpha Beta Society assembled promptly at the ringing of the bell, on last Friday afternoon. The first duty was election of officers. Gus Platt was unanimously elected President. The aforesaid gentleman was absent at the time, and coming in immediately after, was greeted with a long and loud cheering. E. P. Coleman was elected Vice-President; Miss Dora Kinsey, Secretary; Miss Parker, Treasurer; and Miss Sickels, Marshal. The music committee then reported. Extemporaneous speaking should have followed; but "business before pleasure" is our motto; and, on account of the press of more important matters, it was, after some reluctance, passed. We are sure Miss Hoyt's *Gleaner* reflected credit on the Society as well as herself. The speakers waxed quite eloquent in the course of debate; but we hope that the speakers on the affirmative did not consider it labor lost because the judges decided that excessive prosperity is not more dangerous than excessive adversity. Miscellaneous business followed. Question for debate at next meeting, "*Resolved*, That Benjamin Franklin deserves our remembrance more than LaFayette." The leading speakers are Messrs. J. W. Chenoweth and Mr. Hunt. The next *Gleaner* will be published by Mr. Coleman and Miss Lizzie Cox. On account of the joint session, our next regular meeting will be in two weeks. M. E. S.

The Webster Society met last Saturday evening in Telegraph Hall. After roll-call and prayer, passing orders of debate and extemporaneous speaking, we listened for about an hour to a really eloquent lecture upon phrenology, by Mr. Aley. We then proceeded with the election of officers. The following is the list: President, D. S. Leach; Vice-President, G. F. Thompson; Secretary, M. A. Reeve; Treasurer, J. A. Sloan; Librarian, E. C. Paine; Corresponding Secretary, C. E. Wood; Reporter, G. F. Thompson; Critic, L. W. Call.

All orders of exercises were postponed until next meeting, in order that the Society might adjourn at ten o'clock. "Time is money," is our maxim; and thus you see that, "although we had spent but two hours in our exercises, we all parted feeling that it had been two hours pleasantly and profitably spent." WOOD.

Next Friday afternoon the two literary societies of the College will celebrate their entrance into the new Society Hall by holding a joint session. A special programme has been prepared, and the students anticipate a pleasant time. The programme is as follows:

Opening Address.—Miss Grace Parker.

Chatter-Box.—Edited by Noble A. Richardson and Miss M. E. Sickels.

Debate.—"*Resolved*, That there should be a standard measure of ability, below which men should not be permitted to serve as jurors; and that the law should provide a board of examiners, whose duty it shall be to apply the test." Affirmative, A. T. Blain and Warren Knaus; negative, J. D. Hartmann and George Rose.

Closing Address.—Darwin S. Leach.

A general invitation is extended to Faculty, students and outsiders to be present, and thus help make the session one long to be remembered. A report of the meeting will be given next week.

NATIONALIST ITEMS.

Houghton's stable is again on its travels — probably for the last time.

Last week Mrs. Meeker picked a violet in blossom in Prof. Ward's garden.

Orville Huntress has several crab-apple trees in blossom, and one of them has quite large apples on.

New students are constantly arriving at the College. There is great need of more room and more professors.

Rev. Wm. Knipe has made a snug sum by selling 80 of his 640 acres up the Blue to the railroad. Consideration, $2,400.

About midnight on the night of November 13th, two weeks from to-day (Thursday), a wonderful shower of meteors is expected by scientific men.

The superintendent of the K. P. sent here for fifteen carpenters, to go west to work a few weeks, and only three of our great host could leave their present engagements.

The new town of Garrison is located about fifteen miles from Manhattan, where the K. C. R. R. strikes the valley of the Big Blue River. A more desirable situation for a town could not be obtained in Kansas.

Messrs. Gifford, Allen and Haskins attended the great sale of fancy stock at Kansas City last week. They purchased some very fine animals, which were shipped up a few days ago. Riley county can't be beat for fine stock.

The Manhattan Choral Union is again a live institution. Having passed through the dull routine of electing its officers by ballot, of appointing its committees, and discussing the time and place of its meetings, the kind of music to be practiced, etc., it will now settle itself down to business, in the line of musical enjoyment and musical culture.

DIRECTIONS TO APPLICANTS.

TERMS OF ADMISSION.

Candidates for admission must be fourteen years of age, and pass a satisfactory examination in reading; arithmetic, through decimal fractions; and English grammar, to syntax. Classes are started at the beginning of each year in Drill in Arithmetic and Drill in English; and the pupil must have the knowledge above indicated, else he will be unable to retain position if admitted.

Pupils will be received at any time during the year, if able to pass an additional examination upon the subjects studied by the classes which they expect to enter. But they will find it greatly to their advantage to be present at the opening of each term, or as soon thereafter as possible.

GRADES.

Both the Literary and Industrial recitations are graded daily upon a scale of 100; and an examination of all classes is made at the close of each month. A student not attaining an average grade of sixty is promptly dropped to a lower class, or excluded from the Institution until able to do so. The work of grading is strict and uniform in all the departments, and this process is rigorously used for sifting out incompetent and indolent pupils; thus more than accomplishing all that is designed to be effected by a "high standard of admission." Hence, the student's continuance in the College wholly depends upon his own action.

The course is based upon the determination to make the labor required in the preparation of one industrial and three literary recitations as much as the average student can perfectly perform, in ten hours a day. We design to give the pupil the worth of the time expended at College; and, in order thereto, he must do a full day's work with brain or hand. Only those students who can maintain a standing of ninety in each study will be allowed to take more than the prescribed number of recitations; and no one will be permitted to have less than one industrial and three literary recitations.

RELIGIOUS.

Unless otherwise directed by parents, students are required to attend chapel at 8:30 A. M. on academic days, and divine service once every Sabbath.

EXPENSES.

There are no charges whatever for enrollment, attendance or instruction in the regular courses; nor are there any "contingent fees" for the repair of buildings, for the use of books or apparatus, for diplomas, or the kindred privileges usually grouped under the term "contingent." Male students are furnished instruction, the use of apparatus, instruments or tools, in both the literary and industrial classes marked out for them, without any charge. And the same is true of female students in the regular classes provided for them. Printing and Telegraphy are industrials primarily provided for the education of female students, and male students taking either of these are charged $1 per month for use of instruments.

Instrumental music is a fine art or "accomplishment," rather than a mechanical art. We do not place it among our "industrials" in the same sense, or for the same purpose, that we do those provided for teaching the trades. Accordingly, the following fee is required from female students for tuition and the use of instruments:

Terms per week:

Private lessons, 2 a week, on any instrument, $1.00
Private lessons, 1 a week, on any instrument, .60
Class lessons, 2 a week, on any instrument, .65

Instruction in harmony, etc., etc., from ten to fifty cents per week, as the student may or may not be in other classes.

The only charge made for material in either the literary or industrial departments is for the chemicals used by students in laboratory practice, which are furnished at wholesale prices, and amount to but a small sum.

Furnishing an absolutely free education is as much as can be reasonably asked; and the Institution neither boards, clothes, nor supplies the student with text-books. Boarding can be obtained in private families at from $2.75 to $4 per week. Washing costs from seventy-five cents to one dollar per dozen. Text-books, which can be procured in Manhattan, cost from $2 to $5 per term.

No student need expend over $5 per week; and many of our best pupils are living at $1.25 per week. Students desiring to "board themselves" can do so at from $1 to $2 per week. In a club of four young men, renting a house, the average cost to each for the term was $1.11 per week.

LABOR.

Manual labor by the students may be for either of two purposes: First, to acquire skill in a given art; second, to earn money. In the first case, the labor is educational; in the second, it should be paid for by the party benefited.

Educational Labor.—Manual labor in the reciations of the Industrial Departments, like mental labor in those of the Literary Departments, is purely educational and will not be remunerated. While the interest of the student will be held paramount in the direction of this labor, the practice necessary to dexterity will be required.

Remunerated Labor.—When the Institution needs labor on the Farm or elsewhere which is not educational, but simply for its own profit, and which a student is able and willing to perform, it becomes an employer instead of a teacher, and he an employe instead of a scholar. It pays for work, he works for pay. The relation between them is commercial, not educational; and both parties must act upon business principles. Hence, the College furnishes only such employment as its own interests require, and will pay according to the value of the service rendered at from seven to ten cents an hour.

AMOUNT EARNED.

It is impossible to predict how much a given person can earn, since that depends upon what he can do and what work there is to be done. Hence, it is wholly impossible for us to answer the question so often asked: "Do you think I can meet my expenses by work?" Some students make one-half their expenses, some the whole, and exceptional men have made more than expenses. As a rule, a faithful boy skilled in farm work can earn half his expenses on the Farm or in the Nursery. During the year he can ordinarily acquire sufficient skill in the wood or iron shops to enable him to make articles for sale. The whole question is one for his own consideration and decision. We can teach all who come, but cannot absolutely *promise* anything more. Hitherto we have refrained from holding out strong inducements respecting the amount of labor we might have to offer; but in view of the fact that during each of the last three years we have had more to do than the students could perform, we are inclined to give greater and positive encouragement on this point. Any boy who is in dead earnest, who is familiar with farm operations, and who can raise $50 to start with, should be able to carry himself through the four years' course. And certainly this places an education within the reach of every determined boy. As yet we are unable to offer similar advantages to girls, not requiring labor in the College departments which they can perform.

RULES.

1. Behave as a true man or woman should, at all times and in all places.

2. Attend to your own business promptly, thoroughly and courteously; and vigorously let alone that of other people.

3. Penalty: "Leave!"

PUBLICATIONS.

THE INDUSTRIALIST, a weekly journal edited by the Faculty and published by the Printing Department, contains original and seasonable articles on the Farm, Orchard, Trades, Sciences, and Education. Price, 75 cents a year. Address A. A. Stewart, Manhattan.

CALENDAR.

Fall Term, 1879.—Began Wednesday, September 10th, 1879, and will close December 18th, 1879.

TO NEW STUDENTS.

Bring the text-books you have been using. On arrival, first arrange for your boarding. A. A. Stewart will furnish information, either by letter or on application, concerning boarding places or rooms for rent. Report to the President at 8:30 A. M., immediately after chapel exercises, for enrollment.

For further information apply to M. L. Ward, President *pro tem*, Manhattan, Kansas.

LITERARY SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in the College Chapel every Friday at 2 P. M. Ladies admitted. New students cordially invited to attend. GEORGE ROSE, President.
MISS ROWENA WHALEY, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Telegraph Hall every Saturday evening. Visitors, especially students, always welcome.
NOBLE A. RICHARDSON, President.
GEORGE F. THOMPSON, Secretary.

RAILROAD TIME-TABLE.

KANSAS PACIFIC RAILWAY.

PASSENGER ARRIVES.

No. 2, going East..... 11:58 A. M.
No. 4, going East..... 3:28 A. M.
No. 1, going West..... 4:03 P. M.
No. 3, going West..... 4:51 A. M.
No. 7 (freight), going West..... 8:45 A. M.

Nos. 1, 2 and 7 run daily. No. 3 runs daily except Monday. No. 4 runs daily except Sunday. Passengers with tickets are carried on No. 7.
GEO. C. WILDER, Agent.

THE INDUSTRIALIST.

SATURDAY, NOVEMBER 1, 1879.

Industrial Education.

The real value of an education to the student depends upon two things: First, the practical worth of the knowledge taught; and, second, the degree in which he makes it his own. Hence, the ability of any institution to give a practical education depends upon the kind and aim of the knowledge it teaches, and upon the thoroughness of the instruction therein. The State Agricultural College was directly endowed by Congress, and is guided by the State, for the specific purpose of furnishing to the industrial classes of Kansas a "practical" education, that is, "one fit for use." As its name indicates, and as the statistics of the industries of the State require, its chief work must be that of giving a useful and usable education to those who will engage in farming; and, therefore, the Farmer's Course must, from the nature of the case, be its main one.

FARMER'S EDUCATION.

Words and figures are merely instruments with which to record ideas. They are not themselves ideas, nor should they be made the chief end of an education. As a wagon is necessary to haul grain, so are they a necessary part of an education; but as the wagon is not the grain, so they are not the knowledge which the farmer converts into money. Hence, the classics and higher mathematics are not taught. But it will be noticed in the following course that so soon as the pupil acquires working skill in the use of the English language as a tool, and of figures and lines as mathematical tools, those arts and sciences which present knowledge that has a cash value to the farmer are taught as rapidly as their importance and thorough acquisition will permit. Studies numbered (1) and (4) in the second, third and fourth years are the spine of the course, to which the others are as ribs and muscle.

FARMER'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Practical Agriculture (advanced.)		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	1. Drill in English.
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	2. Drill in Arithmetic.
3. Polit. Economy, Practical Law.		3. Practical Geometry.		3. Algebra.		3. Industrial Drawing.	3. Industrial Drawing.
4. Zoology.		4. Horticul., Landscape Gardening.		4. Practical Agricul. (elementary).		4. English Structure.	4. English Structure.
5. Agricul. Chemistry.		5. Organic, Analytical Chemistry.		5. Physics.		5. Adv'd Arithmetic, Book-keeping.	5. Adv'd Arithmetic, Book-keeping.
6. Logic.		6. Practical Surveying.		6. Industrial Drawing.		6. U. S. History, Industrial Drawing.	6. U. S. History, Industrial Drawing.

WOMAN'S EDUCATION.

Nearly one-half of our students are females, and the Woman's Course is prepared expressly for their liberal and practical education. We have no doubt whatever that practical men and women, who understand what it means and what it seeks to do, will fully endorse it.

WOMAN'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Farm Economy, Special Hygiene.		1. Botany, Entomology.		1. Physiology.		1. Drill in English.	1. Drill in English.
2. Geology, Mineralogy.		2. Inorganic Chemistry.		2. Rhetoric.		2. Drill in Arithmetic.	2. Drill in Arithmetic.
3. Polit. Economy, Practical Law.		3. Industrial Drawing.		3. Algebra.		3. Industrial Drawing.	3. Industrial Drawing.
4. Zoology.		4. Horticul., Landscape Gardening.		4. English Literature.		4. English Structure.	4. English Structure.
5. Phys'l Geography, Meteorology.		5. Organic, Household Chemistry.		5. Physics.		5. Adv'd Arith., Book-keeping.	5. Adv'd Arithmetic, Book-keeping.
6. Logic.		6. Household Economy.		6. Industrial Drawing.		6. U. S. History, Industrial Drawing.	6. U. S. History, Industrial Drawing.

MECHANIC'S EDUCATION.

Because of the adaptedness of the leading course to the wants of the intelligent mechanic, it has been found practically unnecessary to diverge from the Farmer's Course. Additional studies, specially adapted to the mechanic's use, will be furnished in a Post-Graduate's Course.

If it be urged that the distinctively agricultural knowledge taught in the Farmer's Course is not directly valuable to the mechanic, we reply that, admitting the point for the purpose of argument, yet: 1. This knowledge is of more practical value to the mechanic than is the Latin, Greek, or a half dozen other things embraced in the usual course preparatory to the professions; 2. That the great majority of Kansas mechanics will also be more or less engaged in agriculture; 3. That those studies in the course which are directly valuable to the mechanic, together with the shop facilities, offer a better mechanic's education than can be elsewhere found west of the Alleghanies.

INDUSTRIAL DEPARTMENTS.

Having knowledge in the head is one thing; ability to use it with the tongue, fingers or feet is quite another thing. Both are vital to success in practical life. A man might thoroughly understand the theoretical principles of carpentry, and yet, not having used the tools, be wholly unable to earn carpenter's wages. So in all other vocations. Accordingly, instruction is given in the following well-equipped Industrial Departments, and every student is required to recite in some one of them, as selected by the pupil or parent:

FOR MALE STUDENTS.	FOR FEMALE STUDENTS.
The Farm.	Dress-making.
The Nursery.	Printing.
Carpentry.	Telegraphy.
Cabinet-making.	Scroll-sawing.
Turning.	Carving.
Wagon-making.	Engraving.
Painting.	Photography.
Blacksmithing.	Instrumental Music.

Each of these departments is conducted exactly as in daily life, and aims to give precisely the drill received by an apprentice. No charge is made, either for tuition or material, from male students taking the Industrials provided for them; nor from female students taking the ones provided for them, except in Instrumental Music. Male students taking either Printing or Telegraphy are charged $1.00 per month for the use of instruments and material.

DEPARTMENTS OF INSTRUCTION.

DEPARTMENT OF AGRICULTURE.

PRACTICAL AGRICULTURE.

Second Year:—General principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage.

Fourth Year: General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of a rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farmhouses; barns.

FARM ECONOMY.

Woman's Course, Fourth Year: Dairy products as human food; influences affecting character of milk; manufacture of condensed milk; the factory system and household plan of cheese-making; treatment of rennet; general process of cheese manufacture; subsequent t eatment of cheese; butter-making; creameries; "deep" and "shallow" setting systems; general process of butter-making; packing and preserving butter.

DEPARTMENT OF BOTANY AND PRACTICAL HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest; also a course of lectures on Landscape Gardening. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard; fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture; shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in in the work of laying out and plotting grounds topographically.

CHEMICAL DEPARTMENT.

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life. Text-book, Ganot.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blowpipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

Are constantly in progress in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

DRILL IN ENGLISH.

"As grammar was made after language, so ought it to be taught after language."—*Herbert Spencer.*

Drill in English embraces the following topics:

Sounds of the language; drill in producing the vocal, sub-vocal and aspirate elements with accuracy, distinctness and volume; vowels, consonants.

Letters: Form; power; rules for spelling, drill.

Words: Signification, properties, modifications, variations, relation and dependence.

Sentences: Drill in statement of ideas; description, clearness, terseness, vigor; business letters, discussion; capitalization; syllabication; punctuation; construction and analysis of sentences; elements, uses and names; criticism of compositions printed as written; proof reading; grammatical construction; superfluous words and clauses; drill in reading, speaking and penmanship.

Text-books: Webster's Academic Dictionary; Lee & Hadley's Advanced Lessons in Language.

Pupils deficient in spelling, etc., should enter the printing class, the printing-office being the work-shop of language.

STRUCTURE OF ENGLISH.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

MATHEMATICAL DEPARTMENT.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

DRILL IN ARITHMETIC.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Following this line, the student, so far from hammering away at "pure" science draws from the mathematical store-house what he needs, and sees why he needs it. Accuracy of calculation and posting, rather than a *mere* comprehension of the principles, is aimed at. Besides the recitation-room drill in business forms, practice in the field is also given. Estimating the number of cords in a pile of wood said to be 100x4x4 feet is one thing; measuring a pile of wood through which any number of cats may be harmlessly thrown, and in which four-feet sticks are the exception, is quite another and more difficult thing.

ARITHMETIC AND BOOK-KEEPING

Is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides ensuring arithmetical practice, develops practical skill in that important art.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admiral system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study. In addition, constant practice in the application of lines to metal and wood is furnished in the Blacksmith, Carpenter, Turning, Scroll-sawing, Carving, Engraving and Printing shops, and to fabrics in the Sewing Department.

PRACTICAL GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the use of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

PRACTICAL SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

STUDIES SPECIAL TO WOMAN.

Besides the studies already indicated, attention is called to the following:

SPECIAL HYGIENE.

As shown in the course, one term is devoted to the study of Physiology, from the text-book of Dr. J. C. Dalton. This is followed in the fourth year by a course of lectures to young ladies by Mrs. Cripps on the subject of Hygiene, embracing such instruction in hygienic matters as are valuable to woman.

FARM ECONOMY considers those affairs of the farm which usually come under the supervision of the farmer's wife or daughter, and which are not included in "gardening" or "household economy;" such as butter and cheese-making, dairy management, etc. A course of lectures is delivered by the Professor of Practical Agriculture. See heading, "Farm Economy."

GARDENING is included in Practical Horticulture. See heading, "Landscape Gardening."

HOUSEHOLD CHEMISTRY. See heading, "Household Chemistry."

HOUSEHOLD ECONOMY

Follows Household Chemistry and consists of lectures by Mrs. Cripps on the art of house-keeping, embracing cookery, domestic management, and kindred topics. Many elderly gentlemen sufficiently know, and more young gentlemen will duly discover, that systematic knowledge of how cooking ought to be done is luminously different from the ability to do it. Instruction without practice can effect but little. Accordingly, a kitchen laboratory has been completely furnished, and affords every facility for drill in the art of cooking. This drill chiefly differs from that of a kitchen in the respect that after a girl has learned to wash dishes or pare potatoes she is not kept everlastingly at either. After full trial, we have found it just as feasible to give this practice, with profit and pleasure to the pupil, as it is to give laboratory practice in chemistry,—and no more expensive.

Printing!—Daily instruction and drill in the work of a First-Class Printer. The Literary Departments offer a thorough education in the construction and use of the English Language, as employed by the Proof-Reader; in Book-Keeping; and in Industrial Drawing, as the best developer of that taste necessarily exercised by every good Job Printer. The Printing Department is well furnished with all the facilities for a speedy mastery of the art of Printing, and is in charge of a practical printer. Besides regular class instruction in printing, the weekly publication of the INDUSTRIALIST by the Department furnishes advanced students the requisite drill in newspaper work.

THE INDUSTRIALIST

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THE INDUSTRIALIST.

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Plain Talk to Young Men.

Remember, young friend, that the world is older than you are by several years; that for thousands of years it has been full of smarter and better young men than yourself; that when they died the old globe went whirling on, and that not one man in a hundred millions went to the funeral, or even heard of the death. Be as smart as you can, of course; know as much as you can; shed the light of your wisdom abroad in the world, but don't try to dazzle or astonish anybody with it; and don't imagine a thing is so, simply because you happen to think it is; don't be too sorry for your father because he knows so much less than you do. He used to think he was as much smarter than his father as you think you are smarter than yours.

The world has great need of young men, but no greater need than the young men have of the world. Your clothes fit better than your father's fit him; they cost more money; they are more stylish. He used to be as straight and nimble as your are. He, too, perhaps, thought his father old-fashioned. Your mustache is neater, the cut of your hair is better, and you are prettier, oh, far prettier than "pa." But, young man, the old gentleman gets the biggest salary; and his homely, scrambling signature on the business end of a check will drain more more money out of the bank in five minutes than you could get out with a ream of paper and a copper-plate signature in six months.

Young men are useful, and they are ornamental, and we all love them, and we couldn't engineer a picnic successfully without them. But they are no novelty. They have been here before. Every generation has had a full supply of them, and will have to the end of time; and each crop will think themselves quite ahead of the last, and will live to be called old fogies by their sons. Go ahead. Have your day. Your sons will, by and by, pity you for your old, odd ways. Don't be afraid your merit will not be discovered. People all over the world are hunting for you, and if you are worth finding, they will find you. A diamond is not so easily found as a quartz pebble, but people search for it all the more intently.—*Phrenological Journal.*

Kansas Railroads.

The following excellent compilation of facts concerning Kansas railroads we take from the St. Joseph *Herald*; and in it is a good showing for the great railroad boom of our State:

A new railroad map of Kansas is greatly needed. None has been issued since January; and the railway guides issued every month consume a year in changing maps and noting extensions.

We can only note some of the recent new lines. The Gulf road has built a branch from Baxter Springs to Joplin, in this State. The St. Louis and San Francisco has extended its Carthage, Mo., branch from Oswego to Cherryvale, twenty-seven miles. About the middle of November it will be completed to Fredonia, the county seat of Wilson county. Next year the managers promise to push it on through Elk and Butler counties to Wichita. The Galveston road is going west from Independence, also seeking the Arkansas through Chautauqua and Cowley counties, and probably bound for Winfield.

The Missouri Pacific has extended the Holden branch from Paola to Garnett, and makes large promises to continue its line west.

The Kansas Pacific is putting down iron on the abandoned road from Lawrence to Carbondale.

Topeka's narrow gauge through Wabaunsee county to Council Grove seems to be abandoned. There is a line proposed from Burlingame to Manhattan, and the Santa Fe is said to be interested in it.

The Ottawa and Burlington road is also attempting to go southwest to Eureka.

The Santa Fe has built a line from Emporia to Eureka, which has passed through Greenwood county, and may go on to the Indian Territory.

It has also built a line from Florence and Marion Center to McPherson. It may be extended to Ellinwood and become the main line for fast trains.

The Santa Fe has also gone down the Arkansas to Winfield, and will soon be in Arkansas City, near the Territory. A branch of this line crosses the river to Wellington in Sumner county.

The Kansas Pacific has completed its Junction City branch to Corcordia, that branch being now 70 miles long.

Its Solomon Valley road will reach Beloit, from Minneapolis, this week, and the promise is to take it to Cawker.

The Salina and Southwestern branch of the K. P. now numbers 21 miles.

The Kansas Central, or Leavenworth Narrow Gauge, will soon reach Blue river.

The Central Branch has shown more activity this year than ever before. Last year at this time she was pushing into Concordia. Now there is a branch from Concordia to Scandia, which will probably go up the Republican to Red Cloud, and connect with the Nebraska system. Jewell and Smith counties will also be supplied by the Central Branch. The main line has gone on to Cawker, where both Forks of the Solomon are preempted, the North Fork line going to Kirwin, and the South Fork to Bull City. This road is now beyond the central line of the State, and has a fair start for Denver. The Nebraska road has filed on the Republican river claim, and the Central Branch will have to make the most it can of the Solomon. The two forks come nearly together in the extreme west of Kansas.

The last line to note is the one that is pushing down the Blue from Beatrice, Neb., and will soon reach Marysville. Of its extension to Manhattan next year, there is no doubt.

Seventy-two counties in Kansas now have one or more railroads, and in some counties the red lines are very numerous. The progress has been very remarkable, and is altogether unprecedented in a new State.

How Nutmegs Grow.

Nutmegs grow on little trees, which look like small pear trees, and are generally over twenty feet high. The flowers are very much like the lily of the valley. The nutmeg is the seed of the fruit, and mace is the thin covering over this seed. The fruit is about as large as a peach. When ripe it breaks open and shows the little nut inside. The tree grows on the islands of Asia and in tropical America. They bear fruit for seventy or eighty years, having ripe fruit upon them at all seasons. A fine tree in Jamaica has over 4,000 nutmegs yearly. The Dutch used to have all this nutmeg trade, as they owned the Banda Islands, and conquered all the other traders and destroyed the trees. To keep the price up, they once burned three piles of nutmegs, each of which was as large as a church. Nature did not sympathize with their meanness. The nutmeg pigeon, found in all the Indian islands, did for the world what the Dutch determined should not be done,—carried the nuts, which are their food, into all the surrounding countries, and trees grew up again, and the world had the benefit.—*Boston Journal of Commerce.*

PROSPERITY originates with the farmer.

Wind-Breaks for Cattle.

Make a shelter for your stock. Prepare a place where they can go and be protected from the wind. This is an old subject—one that has been written about time and time again, but it will never be worn out as long as so many farmers neglect to provide for their animals. Wind-breaks are necessary to the comfort and good condition of cattle in every portion of the country, and especially so in prairie States like Kansas. In a timber State, if cattle are permitted to run at large, they can protect themselves, in a measure, by going into the woods; but in this country, unless you provide a shelter for them, they must be exposed to the storm in all its fury, and can do nothing but turn their tails to the wind, hump up their backs, and shiver. You know the good book tells us the merciful man is merciful even unto his beast; and when you look out of the window of your comfortably-warmed room, and see your poor brutes trying to find shelter from the driving storm by huddling together on the leeward side of a wire fence, your conscience must tell you that Providence will not hold you guiltless as long as you practice such cruelties toward your dumb animals. Many a man who imagines himself very good and pious, who attends church regularly, pays the preacher promptly, and does a great many other things that good men ought to do, will be greatly surprised, when he leaves the earth and approaches St. Peter's place at the entrance of heaven, to find the grim ghost of a shivering ox standing right athwart the pearly gates and blocking the way that leads to the golden streets.

But, if you have no fears of the hereafter, and are not moved by appeals to your conscience, then let the *Homestead* argue with your pocket. It pays to take care of your cattle; it pays to protect them from the storm, and to keep them comfortable; they eat less and come out in far better condition in the spring. If you have only a few head of stock, you will save enough in corn and beef, in one season, to pay you for all the trouble and expense of providing them with good, comfortable quarters.—*Western Homestead.*

FORTY-FIVE millions of grape-vines, occupying 60,000 acres, are growing in California; while the area of land in that State, suitable for the grape, is said to be greater than in France, which produced in ten years ending in 1877, an annual average of 1,400,000,000 gallons of wine.

THE Department at Washington, by its land records, shows the following facts respecting the disposition of the public lands in the past year or two, from which it appears that for the year ending July 1, 8,650,000 acres were taken. In 1877 the number of acres taken was 3,480,000. In 1878, 7,760,000. The amount taken up the first three months of the present fiscal year indicates a total for the year of nearly 10,000,000 of acres.

THE statistician of the New York Produce Exchange, after a careful estimate from authoritative reports, places the wheat crop of the United States for 1879 at about 425,000,000 bushels.

The spring wheat crop will not be so large as was at first expected, that of Minnesota being no more than 28,000,000 of bushels instead of 40,000,000, as estimated early in the season. The amount consumed by 48,000,000 people, plus the amount required for seed and other purposes, is placed at 250,000,000 bushels, leaving 175,000,000 for export, 160,000,000 bushels for Europe, and 15,000,000 for other points.

EVERY farmer should take this paper.

THE INDUSTRIALIST.

SATURDAY, NOVEMBER 8, 1879.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY

THE present term will close Dec. 18th. The next term will open Jan. 2d, and close about June 10th. Those who intend to enter the College next term should understand that only those studies in the course for the spring term can be taken. The class in arithmetic will commence at percentage.

NUMEROUS complications in voting school bonds are continually taking place, on account of the change in the law, made last winter. Under the old law, a two-thirds vote of those present and voting legalized the bonds. The present law requires a majority of all the voters in the district, both male and female. If the papers throughout the State would call attention to this change in the school law, it would probably save some of their patrons and readers a good deal of trouble.

The Mind-Directed Hand.

Were it required to define man, we should not call him an intellect, but the being with the hand. If the globe were depopulated to-day, and an angel commissioned to-morrow to seek the evidence that man had existed, he would not look for the geological remains which strewed the earth, but would seek it in the capitulation of conquered and captivated nature. In a word, he would seek it in the mind's mastery over matters achieved through the agency of its companion and instrument,—the human hand. Dr. Franklin defines man as a tool-making animal.

There are those who continually strive to get up an artificial storm,—a war between those who live by their "wits," as it is contemptuously termed, and those who live by the labor of their hands. Hence, we hear much about "hard-handed industry" and "hard-fisted honesty." Associations are formed on this principle of distinction. Speeches are made, appealing to the hands, rather than to the hearts and brains of men; and books are written to prove the vast superiority of manual over mental labor. Just as if the brain of Davy produced not as noble a work when it devised the safety lamp, as the mechanic who wove the fabric of which the lamp was made; or, as if the astronomer who rent the Milky Way,—that temple vail of Almighty God,—did not do as much to elevate his fellows, and lift them up to a new and nobler prospect, as he who reared the dome of the National Capitol to the clouds. We have heard of a hundred-handed but headless Briareus, of a blinded Sampson, who grasped for the pillars of the temple; but who ever heard of anything good or great in science or art achieved without the application of the mind-directed hand? We have heard of thoughts that breathe, and marbles that breathe: the one is mind's spiritual creation, the other is that creation's dwelling-place. One can no more conceive of a hand without a mind than a hope without a heaven. The glimmering hope will be lost in the full light of paradise; so the laboring hand will forget its cunning, when the soul in full perfection shall pass that bourne beyond which there is "no work nor device forever."

Carlyle condemns labor-saving machines on the ground of humanity. But should they be so regarded? Should not every additional spindle, propelled by the fall that tumbles idly in its channel, every moment that the "iron horse" saves to the traveler, be deemed a blessing, if it gives time to the artisan and the traveler, for mental improvement? But, if the railroads and telegraphs are regarded as ends,—if they are valued merely as affording speedy means of replenishing the store-house and the market, and not that by them knowledge may be borne as upon the wings of the wind, the ends of the earth brought near, or truth dart with the electric flash,—then indeed would they be a waste of talent and time.

The hand should be respected as a wonderful servant of the head. Who shall say which is the more sublime, the voice of the missionary, lifting up the cross on heathen shores, or the click of the type in the printer's stick, which shall give to the nations "all the words of this life"? Many are the examples thronging the mind with the truth of the statement that man, with all his intellect, would be the most helpless of beings without the hand. What moral revolutions it has wrought! and what mischief has the failure to use it at the critical moment entailed upon mankind!

If by any possibility we could make ourselves invisible, and look in upon the "author world" without introduction, what a scene would be spread out before us. Here one makes the finishing figure of an astronomical calculation that shall fill the world with wonder; and here the true daughter of song indites the line that glows like the wing of a seraph. There, with throbbing brow, the historian is writing the last page of his ponderous volume, and pausing as he wonders if these lines will live when he is dead. In a corner sits a reviewer, writing the fatal word which kills some hapless aspirant for fame. How pens and pencils glide over paper, on all themes, in all languages, and at all times. All engaged with head and hand in producing the beautiful, the useful, or the vile.

We hear much of the eloquence of words, but where shall we look for the eloquence of deeds but to the mind-directed hand. Thoughts, big with the fate of a new world, conceived within the closed doors of a Senate chamber, saw the light amid the roar of artillery; and noble conceptions flashed from gleaming blades, and freedom rose blushing from the red baptism of a battle-field. Nature's own blind strength the mind-directed hand employs against herself, destroying resistance with resistance. The oar smites the water, and the boat shoots away. The artful wedge cleaves the solid oak, and it is rent in twain. Armed with a simple lever, one hand moves lightly what many unassisted had assayed in vain. Mind wills, the hands move, and the mountain's iron ribs are torn away and formed into massive bars or ductile threads. The iron ship floats lightly, while the iron anchor lies deep and holds her fast. What carried aloft those masses which crown the pyramid's dizzy hight? Not the wind, in its untamed strength; not the wave, with its resistless fury; not the unconscious might of oaken beam or iron bar,—but the mind-directed hand. ***

The Apple-Leaf Crumpler.

In many orchards, after the trees have lost their leaves, there may be seen, attached to the twigs by silken threads, numerous unsightly bunches of brown, withered leaves, that remain throughout the winter unless removed by picking. If some of these bunches be examined, there will be found within, irregular tubular cases, each containing a reddish brown larva, somewhat less than one-half an inch in length. This is the larva called by B. D. Walsh the rascal leaf-crumpler, and is the young of a small gray-brown moth known to the entomologist as *Acrobasis nebulo*. According to Professor Riley, this insect is more or less common throughout the Western States, and is so numerous in many localities as to be quite injurious, especially in nurseries.

The larva hibernates in its case, which it previously attaches securely to the twig by threads of silk. In the spring, the warmth that starts the buds awakens the insect to a sense of his hunger; and, cutting the threads which fastened the case to the twig, it carries it along until a supply of food be found, when the case is again secured and the feeding resumed. The larva feeds chiefly at night, temporarily leaving the case for this purpose. It does not restrict itself to leaves alone, but destroys swelling buds and young fruit, or gnaws the tender bark upon young twigs. Its full growth is reached about the last of May; and, assuming the pupal form within the case which protected it as a larva, it is quiet for a short time, and in June appears as a perfect moth. The eggs of the moth are soon after deposited upon the leaves; and from these are hatched a brood of larvæ which attain about one-third their full size before they are deprived of food by the fall of the leaves, and complete their transformations the following spring.

The increase of this insect is measurably checked by at least two parasites,—a small fly resembling the house-fly, and a small four-winged fly of the ichneumon family. The former has grown so numerous in some localities as to greatly reduce the numbers of the leaf-crumpler.

The cases containing the destructive larvæ are rendered conspicuous by the fall of the leaves in autumn; and, during the winter, the leaf bunches should be carefully collected and, as suggested by Prof. Riley, thrown into the center of a meadow or other field, away from any fruit trees. Here the larvæ will be unable to reach proper food, and will wander around a short distance and finally die from starvation; while such of the parasites as are nearly grown will mature and escape, to assist the orchardist by infesting other larvæ of the kind.—*Prof. Popenoe.*

SPECIAL ADVANTAGES.

We enumerate a few of the special advantages which the Agricultural College presents to the young people of the State of Kansas:

First: Although an industrial school, as thorough and as complete an education—using the term in its popular sense—can be acquired here as in other schools. A student will make as rapid advancement here as elsewhere in the studies pursued, whether he remains here one or two years, or through the whole course.

Second: While obtaining a knowledge of English, mathematics, and the natural sciences, every student is learning some useful trade or art. This peculiar feature of the Agricultural College is a success. It should no longer be regarded as an experiment. Those who have been here one, two or three years are now in good positions, receiving good wages as telegraph operators, printers, carpenters, etc. Young men who have been through the course in practical agriculture and horticulture are rapidly becoming known as the best farmers in the localities in which they reside.

Third: The expenses are brought down to the lowest possible point. There are no matriculation fees, no tuition bills, no college customs, which compel a useless expenditure for badges or dress. The expenses are simply the cost of living, and the text-books used.

Fourth: The high moral and religious influence which exists at Manhattan. The students of the Agricultural College are young men and women of excellent character. Their average age is about eighteen years. They are deeply in earnest in their efforts for advancement. Of course there are a few exceptions, but the vicious or shiftless are soon thrown out. "Attend to business or leave" is the one rule. A wholesome religious influence pervades the Institution. The students' weekly prayer-meeting has been well sustained for more than ten years.

THE INDUSTRIALIST.

SATURDAY, NOVEMBER 8, 1879.

Instead of the usual circular or catalogue, we send the Industrialist to those desiring information about the Kansas State Agricultural College. We would call attention to the articles headed "Departments of Instruction," "Industrial Education," "Special Advantages," and "Directions to Applicants." If further information is desired, address Agricultural College, Manhattan, Kansas.

The second written examination of the term will take place on next Friday.

Mr. J. Z. Wright, of Mt. Pulaski, Ill., writes us, kindly proffering the seeds of various useful trees. Mr. W. has already placed us under obligations for favors of this sort.

Some acorns and a specimen of Japanese oak—called, by this slant-eyed people, *nara*—were received from Japan this week. These will be given a trial in the nursery.

Those who have formerly been students in the College will be pained to learn of the death of postmaster Pillsbury, which occurred on Wednesday last. No kinder heart than his ever beat in sympathy with the stranger and the poor.

The following school bonds have recently been purchased by the College: Marshall county—Dist. 72, $200; 95, $600; 97, $500: Sedgwick—Dist. 88, $500; 122, $300; 123, $400: Sumner—Dist. 20, $1,600; 99, $250; 143, $400: Barton—Dist. 82, $475: Republic—Dist. 24, $300: Osborne—Dist. 59, $225: Jewell—Dist. 86, $350: Smith and Osborne—Joint Dist. 74, $200. Total, $6,300.

We spent a few hours the other day in looking over our exchanges,—the last issues before election. We learned that most of the candidates for county offices on the opposition ticket were either thieves, swindlers, drunkards, liars, or fools. As every office in the State was filled on Tuesday last, what a dismal prospect is before the good people of Kansas, who elected such men to do the public business.

We see by the *Tribune* that Mr. Chas. Gleed is in Junction City, looking up agricultural and other statistics for presentation in Europe by Mr. P. B. Groat. Why not give us a chance, Mr. Gleed? We can show you the great agricultural and industrial school of America. We can show also the largest fields of tame grasses in the West, and can demonstrate the possibility of their successful cultivation. The herds of Short-horns, Berkshires, and fine horses, in this vicinity, we know have astonished "the natives;" and we suspect that they would have a like effect on the foreigner.

The month just passed is remarkable for being the warmest October on record at this station; namely, a mean temperature of 61°.13. The mean October temperature, as determined by observations extending over nineteen years, is 53°.59. The mean temperature of October, 1878, is 50°.36. Maximum temperature of the month, 86°; minimum temperature, 22°. The first killing frost of the season was on the 17th, which was followed by a still more severe frost on the 18th.

The rain-fall for the month wss 2.63 inches. Distribution: On the 7th, .25 of an inch; 9th, .10; 12th, .75; 15th, 1.53. Average October rain-fall at this station, 2.13 inches. It will be seen that no rain has fallen since the 15th. During the latter portion of the month, the hygrometer has indicated the presence of but little moisture in the air.

The Webster Society met in Telegraph Hall on Saturday evening, Nov. 1st, for the last time. After roll-call and prayer, the officers-elect were inaugurated, and took their respective places with considerable dignity and complacency. Mr. Lowe was then initiated, and Messrs. E. V. Cripps and H. H. Hopkins were elected as members. The judges decided that Napoleon was a greater man Hannibal. Extemporaneous speaking followed debate, and was, as usual, very lively and entertaining. This exercise would be much more interesting if the questions were selected with greater care. Declamation, composition and reading next evening.

Under the head of new business, the Board of Directors informed the Society that it would meet in the new Society Hall next Saturday evening. We regret to step down and out of the hall in which the Webster Society has held forth so long; but, for the benefit of all concerned, we consent to do so.

X. Y. CÆSAR.

COLLEGE MATTERS.

The enrollment thus far this term is 220. Nearly 200 are in actual attendance. Teachers and students are working hard.

The arrangement for boarding at the Boarding Hall works satisfactorily. The students speak well of Mr. Viles' family; and Mr. Viles declares that a steadier and more civil lot of young men were never found in any one family than the twenty-five who sit at his tables. Board at $1.50 per week. Rooms, unfurnished, accommodating from two to four, at $1.50 per month. Expense for board, room, etc., about $2 per week. The Hall can accommodate about fifty.

Four families of students, numbering fourteen in all, are keeping house in the chapel building. This arrangement also works well. Next term all of the rooms in this building will be occupied.

Two families of students are rooming in the old College building, on the Hill.

There are several other student families occupying rented rooms in town. "Baching" is inconvenient, but it costs less money than boarding. Those who are sowing the seeds of self-denial now will, in years to come, reap a bounteous harvest of advantage.

THE JOINT SESSION.

Yesterday was an important day with the literary societies of the College. It marked the beginning of a new era in the life of each. The Board of Regents having fitted up a large and commodious hall for the use of the societies, arrangements were made between them to mark their first entrance into it by holding a union session which should excel anything heretofore known in their annals. Accordingly, over a hundred persons assembled yesterday afternoon to witness and enjoy the accomplishment of the above-named object.

In the absence of I. D. Graham, who had been selected to preside, A. A. Stewart was chosen to fill that position. The exercises were opened by the singing of an anthem, entitled, "Praise the God of Israel." This was well rendered by Misses Kinsey, Cox and Coolidge, and Messrs. Platt and McBratney. Prayer was offered by Mr. Blain. The opening address was delivered by Miss Parker, of the Alpha Betas. Her duty was very Grace-fully and earnestly performed. She spoke of the societies as rivals and yet seeking one common object; she referred to their dark as well as bright days, and said both were necessary to a healthy and permanent growth; and closed by asking the audience to think of the flights of eloquence, the learned debates, and spicy papers which, in the years to come, will be heard within those walls. The address was followed by a beautiful and appropriate quartette, entitled, "Home by the Sea." It was sung by Misses Cox and Kinsey, and Messrs. McBratney and Sloan.

The debate was on the question as to whether the law should not prescribe a higher qualification for jurors. Affirmative, Messrs. Blain and Knaus; negative, Messrs. Hartmann and George Rose. We have not space to particularize here. While the debate was not very profound, it was quite entertaining. The judges decided that the affirmative had the best of the argument.

The singing of that spirited and patriotic song, "Barbara Freitche," by Miss Selby, was much enjoyed by the audience. The singer rendered the piece in a manner and with a feeling which showed that she had studied it well.

Every one was anxious to hear the "Chatter-Box," which came next. Miss Sickels prefaced her reading with the remark that she did not wish to be "viewed with the critic's eye," for she was appointed only to do the chattering, and was not responsible for what the box contained. As a chatterer, we vote her a success. The box was full of keen hits and droll stories, which were duly appreciated and applauded. Mr. Richardson's box was in the shape of a paper, which evinced care in its preparation, and was well read. The incident in regard to the chap who, in the attempt to say "Cicero and Cæsar," called them "Kic-er-o and Squæs-er," created some merriment on the boys' side.

"Lovely Night" was the title of the last piece of music. It was a quartette, consisting of Misses Selby and Kinsey, and Messrs. Sloan and McBratney, who acquitted themselves creditably. The closing address was delivered by Mr. D. S. Leach, of the Websters. In some respects, it followed the same line of thought pursued by Miss Parker. This was not objectionable, however. It simply showed that the representatives of the two societies were in harmony with each other; that each was thinking of what would best promote the interests of both societies. Mr. Leach dwelt upon the benefits which may be derived from an active membership in a literary society. "In the regular college course," he said, "we are students; in the society, we are teachers: in one, we are receiving instruction; in the other, we are imparting it to others." The opening and closing addresses both bore abundant evidence of the fraternal feeling which, amidst a friendly rivalry, still exist between the societies.

We have no space for comment. The report is already too long. Let us say, in conclusion, that we were much gratified with the meeting, and the spirit which pervaded it; and trust that this may not be the last joint session which the societies shall hold in their new hall.

REPORTER.

Two inches of rain has fallen since last night.

Prof. Geo. T. Fairchild, who for many years has occupied the chair of English Literature in the Michigan State Agricultural College, has been elected President of the Kansas Agricultural College, at Manhattan. Prof. Fairchild is an able teacher and business man; and we congratulate the College Regents on choosing so efficient a President, as well as the Professor on this recognition of his abilities.

The Professor chosen to fill the chair of Horticulture and Botany is a well-known gentleman from the vicinity of Topeka, Mr. E. A. Popenoe, who is an enthusiast in entomology, and will carry into his work the zeal which his love for the study of natural history has created.—*Kansas City Review of Science.*

Professor Ward, of Manhattan, paid the *Farmer* office a visit last week. The Professor has acted as President of the Agricultural College, in the absence of President Anderson; and is earnest, we might say enthusiastic, in the work of placing the State Agricultural College in the front rank of that class of institutions of the country. President Fairchild will take charge of the office during the present month.

The number of students in attendance at the present term is greater than at any time previous; and the increasing popularity of the College is manifested by the numerous inquiries received from all parts of the State. The present faculty are working steadily to make the College the medium of acquiring a *useful* education by our farmer boys and girls, rather than ornamental.—*Kansas Farmer.*

DIRECTIONS TO APPLICANTS.

TERMS OF ADMISSION.

Candidates for admission must be fourteen years of age, and pass a satisfactory examination in reading; arithmetic, through decimal fractions; and English grammar, to syntax. Classes are started at the beginning of each year in Drill in Arithmetic and Drill in English; and the pupil must have the knowledge above indicated, else he will be unable to retain position if admitted.

Pupils will be received at any time during the year, if able to pass an additional examination upon the subjects studied by the classes which they expect to enter. But they will find it greatly to their advantage to be present at the opening of each term, or as soon thereafter as posssble.

GRADES.

Both the Literary and Industrial recitations are graded daily upon a scale of 100; and an examination of all classes is made at the close of each month. A student not attaining an average grade of sixty is promptly dropped to a lower class, or excluded from the Institution until able to do so. The work of grading is strict and uniform in all the departments, and this process is rigorously used for sifting out incompetent and indolent pupils; thus more than accomplishing all that is designed to be effected by a "high standard of admission." Hence, the student's continuance in the College wholly depends upon his own action.

The course is based upon the determination to make the labor required in the preparation of one industrial and three literary recitations as much as the average student can perfectly perform, in ten hours a day. We design to give the pupil the worth of the time expended at College; and, in order thereto, he must do a full day's work with brain or hand. Only those students who can maintain a standing of ninety in each study will be allowed to take more than the prescribed number of recitations; and no one will be permitted to have less than one industrial and three literary recitations.

RELIGIOUS.

Unless otherwise directed by parents, students are required to attend chapel at 8:30 A. M. on academic days, and divine service once every Sabbath.

EXPENSES.

There are no charges whatever for enrollment, attendance or instruction in the regular courses; nor are there any "contingent fees" for the repair of buildings, for the use of books or apparatus, for diplomas, or the kindred privileges usually grouped under the term "contingent." Male students are furnished instruction, the use of apparatus, instruments or tools, in both the literary and industrial classes marked out for them, without any charge. And the same is true of female students in the regular classes provided for them. Printing and Telegraphy are industrials primarily provided for the education of female students, and male students taking either of these are charged $1 per month for use of instruments.

Instrumental music is a fine art or "accomplishment," rather than a mechanical art. We do not place it among our "industrials" in the same sense, or for the same purpose, that we do those provided for teaching the trades. Accordingly, the following fee is required from female students for tuition and the use of instruments:

Terms per week:

Private lessons, 2 a week, on any instrument, $1.00
Private lessons, 1 a week, on any instrument, .60
Class lessons, 2 a week, on any instrument, .65

Instruction in harmony, etc., etc., from ten to fifty cents per week, as the student may or may not be in other classes.

The only charge made for material in either the literary or industrial departments is for the chemicals used by students in laboratory practice, which are furnished at wholesale prices, and amount to but a small sum.

Furnishing an absolutely free education is as much as can be reasonably asked; and the Institution neither boards, clothes, nor supplies the student with text-books. Boarding can be obtained in private families at from $2.75 to $4 per week. Washing costs from seventy-five cents to one dollar per dozen. Text-books, which can be procured in Manhattan, cost from $2 to $5 per term.

No student need expend over $5 per week; and many of our best pupils are living at $1.25 per week. Students desiring to "board themselves" can do so at from $1 to $2 per week. In a club of four young men, renting a house, the average cost to each for the term was $1.11 per week.

LABOR.

Manual labor by the students may be for either of two purposes: First, to acquire skill in a given art; second, to earn money. In the first case, the labor is educational; in the second, it should be paid for by the party benefited.

Educational Labor.—Manual labor in the recitations of the Industrial Departments, like mental labor in those of the Literary Departments, is purely educational and will not be remunerated. While the interest of the student will be held paramount in the direction of this labor, the practice necessary to dexterity will be required.

Remunerated Labor.—When the Institution needs labor on the Farm or elsewhere which is not educational, but simply for its own profit, and which a student is able and willing to perform, it becomes an employer instead of a teacher, and he an employe instead of a scholar. It pays for work, he works for pay. The relation between them is commercial, not educational; and both parties must act upon business principles. Hence, the College furnishes only such employment as its own interests require, and will pay according to the value of the service rendered at from seven to ten cents an hour.

AMOUNT EARNED.

It is impossible to predict how much a given person can earn, since that depends upon what he can do and what work there is to be done. Hence, it is wholly impossible for us to answer the question so often asked: "Do you think I can meet my expenses by work?" Some students make one-half their expenses, some the whole, and exceptional men have made more than expenses. As a rule, a faithful boy skilled in farm work can earn half his expenses on the Farm or in the Nursery. During the year he can ordinarily acquire sufficient skill in the wood or iron shops to enable him to make articles for sale. The whole question is one for his own consideration and decision. We can teach all who come, but cannot absolutely *promise* anything more. Hitherto we have refrained from holding out strong inducements respecting the amount of labor we might have to offer; but in view of the fact that during each of the last three years we have had more to do than the students could perform, we are inclined to give greater and positive encouragement on this point. Any boy who is in dead earnest, who is familiar with farm operations, and who can raise $50 to start with, should be able to carry himself through the four years' course. And certainly this places an education within the reach of every determined boy. As yet we are unable to offer similar advantages to girls, not requiring labor in the College departments which they can perform.

RULES.

1. Behave as a true man or woman should, at all times and in all places.

2. Attend to your own business promptly, thoroughly and courteously; and vigorously let alone that of other people.

3. Penalty: "Leave!"

PUBLICATIONS.

THE INDUSTRIALIST, a weekly journal edited by the Faculty and published by the Printing Department, contains original and seasonable articles on the Farm, Orchard, Trades, Sciences, and Education. Price, 75 cents a year. Address A. A. Stewart, Manhattan.

CALENDAR.

Fall Term, 1879.—Began Wednesday, September 10th, 1879, and will close December 18th, 1879.

TO NEW STUDENTS.

Bring the text-books you have been using. On arrival, first arrange for your boarding. A. A. Stewart will furnish information, either by letter or on application, concerning boarding places or rooms for rent. Report to the President at 8:30 A. M., immediately after chapel exercises, for enrollment.

For further information apply to M. L. Ward, President *pro tem*, Manhattan, Kansas.

LITERARY SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in the College Chapel every Friday at 2 P. M. Ladies admitted. New students cordially invited to attend. GEORGE ROSE, President.
MISS ROWENA WHALEY, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Telegraph Hall every Saturday evening. Visitors, especially students, always welcome.
NOBLE A. RICHARDSON, President.
GEORGE F. THOMPSON, Secretary.

RAILROAD TIME-TABLE.

KANSAS PACIFIC RAILWAY.

PASSENGER ARRIVES.

No. 2, going East	11:58 A. M.
No. 4, going East	3:28 A. M.
No. 1, going West	4:03 P. M.
No. 3, going West	4:51 A. M.
No. 7 (freight), going West	8:45 A. M.

Nos. 1, 2 and 7 run daily. No. 3 runs daily except Monday. No. 4 runs daily except Sunday. Passengers with tickets are carried on No. 7.

GEO. C. WILDER, Agent.

THE INDUSTRIALIST.

SATURDAY, NOVEMBER 8, 1879.

Industrial Education.

The real value of an education to the student depends upon two things: First, the practical worth of the knowledge taught; and, second, the degree in which he makes it his own. Hence, the ability of any institution to give a practical education depends upon the kind and aim of the knowledge it teaches, and upon the thoroughness of the instruction therein. The State Agricultural College was directly endowed by Congress, and is guided by the State, for the specific purpose of furnishing to the industrial classes of Kansas a "practical" education, that is, "one fit for use." As its name indicates, and as the statistics of the industries of the State require, its chief work must be that of giving a useful and usable education to those who will engage in farming; and, therefore, the Farmer's Course must, from the nature of the case, be its main one.

FARMER'S EDUCATION.

Words and figures are merely instruments with which to record ideas. They are not themselves ideas, nor should they be made the chief end of an education. As a wagon is necessary to haul grain, so are they a necessary part of an education; but as the wagon is not the grain, so they are not the knowledge which the farmer converts into money. Hence, the classics and higher mathematics are not taught. But it will be noticed in the following course that so soon as the pupil acquires working skill in the use of the English language as a tool, and of figures and lines as mathematical tools, those arts and sciences which present knowledge that has a cash value to the farmer are taught as rapidly as their importance and thorough acquisition will permit. Studies numbered (1) and (4) in the second, third and fourth years are the spine of the course, to which the others are as ribs and muscle.

FARMER'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Practical Agriculture (advanced.)	1. Botany, Entomology.	1. Physiology.	1. Drill in English.
2. Geology, Mineralogy.	2. Inorganic Chemistry.	2. Rhetoric.	2. Drill in Arithmetic.
3. Polit. Economy, Practical Law.	3. Practical Geometry.	3. Algebra.	3. Industrial Drawing.
4. Zoology.	4. Horticul., Landscape Gardening.	4. Practical Agricul. (elementary).	4. English Structure.
5. Agricul. Chemistry	5. Organic, Analytical Chemistry.	5. Physics.	5. Adv'd Arithmetic, Book-keeping.
6. Logic.	6. Practical Surveying.	6. Industrial Drawing.	6. U. S. History, Industrial Drawing.

WOMAN'S EDUCATION.

Nearly one-half of our students are females, and the Woman's Course is prepared expressly for their liberal and practical education. We have no doubt whatever that practical men and women, who understand what it means and what it seeks to do, will fully endorse it.

WOMAN'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
1. Farm Economy, Special Hygiene.	1. Botany, Entomology.	1. Physiology.	1. Drill in English.
2. Geology, Mineralogy.	2. Inorganic Chemistry.	2. Rhetoric.	2. Drill in Arithmetic.
3. Polit. Economy, Practical Law.	3. Industrial Drawing.	3. Algebra.	3. Industrial Drawing.
4. Zoology.	4. Horticul., Landscape Gardening.	4. English Literature.	4. English Structure.
5. Phys'c'l Geography, Meteorology.	5. Organic, Household Chemistry.	5. Physics.	5. Adv'd Arith., Book-keeping.
6. Logic.	6. Household Economy.	6. Industrial Drawing.	6. U. S. History, Industrial Drawing.

MECHANIC'S EDUCATION.

Because of the adaptedness of the leading course to the wants of the intelligent mechanic, it has been found practically unnecessary to diverge from the Farmer's Course. Additional studies, specially adapted to the mechanic's use, will be furnished in a Post-Graduate's Course.

If it be urged that the distinctively agricultural knowledge taught in the Farmer's Course is not directly valuable to the mechanic, we reply that, admitting the point for the purpose of argument, yet: 1. This knowledge is of more practical value to the mechanic than is the Latin, Greek, or a half dozen other things embraced in the usual course preparatory to the professions; 2. That the great majority of Kansas mechanics will also be more or less engaged in agriculture; 3. That those studies in the course which are directly valuable to the mechanic, together with the shop facilities, offer a better mechanic's education than can be elsewhere found west of the Alleghanies.

INDUSTRIAL DEPARTMENTS.

Having knowledge in the head is one thing; ability to use it with the tongue, fingers or feet is quite another thing. Both are vital to success in practical life. A man might thoroughly understand the theoretical principles of carpentry, and yet, not having used the tools, be wholly unable to earn carpenter's wages. So in all other vocations. Accordingly, instruction is given in the following well-equipped Industrial Departments, and every student is required to recite in some one of them, as selected by the pupil or parent:

FOR MALE STUDENTS.	FOR FEMALE STUDENTS.
The Farm.	Dress-making.
The Nursery.	Printing.
Carpentry.	Telegraphy.
Cabinet-making.	Scroll-sawing.
Turning.	Carving.
Wagon-making.	Engraving.
Painting.	Photography.
Blacksmithing.	Instrumental Music.

Each of these departments is conducted exactly as in daily life, and aims to give precisely the drill received by an apprentice. No charge is made, either for tuition or material, from male students taking the Industrials provided for them; nor from female students taking the ones provided for them, except in Instrumental Music. Male students taking either Printing or Telegraphy are charged $1.00 per month for the use of instruments and material.

DEPARTMENTS OF INSTRUCTION.

DEPARTMENT OF AGRICULTURE.

PRACTICAL AGRICULTURE.

Second Year:—General principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage.

Fourth Year: General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of a rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farmhouses; barns.

FARM ECONOMY.

Woman's Course, Fourth Year: Dairy products as human food; influences affecting character of milk; manufacture of condensed milk; the factory system and household plan of cheese-making; treatment of rennet; general process of cheese manufacture; subsequent treatment of cheese; butter-making; creameries; "deep" and "shallow" setting systems; general process of butter-making; packing and preserving butter.

DEPARTMENT OF BOTANY AND PRACTICAL HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest; also a course of lectures on Landscape Gardening. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard; fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture; shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in in the work of laying out and plotting grounds topographically.

CHEMICAL DEPARTMENT.

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life. Text-book, Ganot.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blowpipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

Are constantly in progress in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

DRILL IN ENGLISH.

"As grammar was made after language, so ought it to be taught after language."—*Herbert Spencer.*

Drill in English embraces the following topics:

Sounds of the language; drill in producing the vocal, sub-vocal and aspirate elements with accuracy, distinctness and volume; vowels, consonants.

Letters: Form; power; rules for spelling, drill.

Words: Signification, properties, modifications, variations, relation and dependence.

Sentences: Drill in statement of ideas; description, clearness, terseness, vigor; business letters, discussion; capitalization; syllabication; punctuation; construction and analysis of sentences; elements, uses and names; criticism of compositions printed as written; proof reading; grammatical construction; superfluous words and clauses; drill in reading, speaking and penmanship.

Text-books: Webster's Academic Dictionary; Lee & Hadley's Advanced Lessons in Language.

Pupils deficient in spelling, etc., should enter the printing class, the printing-office being the work-shop of language.

STRUCTURE OF ENGLISH.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

MATHEMATICAL DEPARTMENT.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

DRILL IN ARITHMETIC.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Following this line, the student, so far from hammering away at "pure" science draws from the mathematical store-house what he needs, and sees why he needs it. Accuracy of calculation and posting, rather than a *mere* comprehension of the principles, is aimed at. Besides the recitation-room drill in business forms, practice in the field is also given. Estimating the number of cords in a pile of wood said to be 100x4x4 feet is one thing; measuring a pile of wood through which any number of cats may be harmlessly thrown, and in which four-feet sticks are the exception, is quite another and more difficult thing.

ARITHMETIC AND BOOK-KEEPING

Is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides ensuring arithmetical practice, develops practical skill in that important art.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admiral system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study. In addition, constant practice in the application of lines to metal and wood is furnished in the Blacksmith, Carpenter, Turning, Scroll-sawing, Carving, Engraving and Printing shops, and to fabrics in the Sewing Department.

PRACTICAL GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the use of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

PRACTICAL SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

STUDIES SPECIAL TO WOMAN.

Besides the studies already indicated, attention is called to the following:

SPECIAL HYGIENE.

As shown in the course, one term is devoted to the study of Physiology, from the text-book of Dr. J. C. Dalton. This is followed in the fourth year by a course of lectures to young ladies by Mrs. Cripps on the subject of Hygiene, embracing such instruction in hygienic matters as are valuable to woman.

FARM ECONOMY considers those affairs of the farm which usually come under the supervision of the farmer's wife or daughter, and which are not included in "gardening" or "household economy;" such as butter and cheese-making, dairy management, etc. A course of lectures is delivered by the Professor of Practical Agriculture. See heading, "Farm Economy."

GARDENING is included in Practical Horticulture. See heading, "Landscape Gardening."

HOUSEHOLD CHEMISTRY. See heading, "Household Chemistry."

HOUSEHOLD ECONOMY

Follows Household Chemistry and consists of lectures by Mrs. Cripps on the art of house-keeping, embracing cookery, domestic management, and kindred topics. Many elderly gentlemen sufficiently know, and more young gentlemen will duly discover, that systematic knowledge of how cooking ought to be done is luminously different from the ability to do it. Instruction without practice can effect but little. Accordingly, a kitchen laboratory has been completely furnished, and affords every facility for drill in the art of cooking. This drill chiefly differs from that of a kitchen in the respect that after a girl has learned to wash dishes or pare potatoes she is not kept everlastingly at either. After full trial, we have found it just as feasible to give this practice, with profit and pleasure to the pupil, as it is to give laboratory practice in chemistry,—and no more expensive.

Printing!—Daily instruction and drill in the work of a First-Class Printer. The Literary Departments offer a thorough education in the construction and use of the English Language, as employed by the Proof-Reader; in Book-Keeping; and in Industrial Drawing, as the best developer of that taste necessarily exercised by every good Job Printer. The Printing Department is well furnished with all the facilities for a speedy mastery of the art of Printing, and is in charge of a practical printer. Besides regular class instruction in printing, the weekly publication of the INDUSTRIALIST by the Department furnishes advanced students the requisite drill in newspaper work.

THE INDUSTRIALIST

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THE INDUSTRIALIST.

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Proposed Archæological Expedition to the Red Sea.

The editor of *Les mondes*, the Abbe Moigno, is highly incensed at the criticisms of various scientists who seem skeptical about certain events narrated in the Scriptures, and especially so at Prof. Richard Owen, who, at a meeting of the Society of Orientalists, in London, 1874, had the audacity to sweep away the Red Sea just where it is said to have been crossed by the Hebrews, in the following words: "The Isthmus of Suez is geologically a bridge of recent date between Asia and Africa: it was completed only during the last Miocene period. However recent this epoch be, from a geological standpoint, it is neverthelss remote enough to have allowed the forces which have given birth to species to establish degrees and distinctions between the great classes of animals living in the two respective seas which the isthmus separates. A zoological mind alone can appreciate the duration of the prehistoric time in question."

The Abbe Moigno now proposes to show men of Owen's way of thinking that they are in error. He believes the time has come to invite the whole Christian world to unite with him in a grand and noble enterprise,—that of fitting out an expedition to go in search of the "eloquent remains of the Egyptian cavalry buried in the Red Sea, with their horses, horsemen, treasures, etc." He states it as his belief that these monumental remains will be discovered by digging for them; and that they will be found in an excellent state of preservation, owing to the action of the salt in which they are buried. It is proposed to form a sort of joint-stock company, the bonds to bear no interest, but the stockholder to be reimbursed by a division of the money proceeding from the sale of the discovered treasures. Subscriptions to the enterprise are to be sent to the office of *Les Mondes*, at Paris. —*Scientific American.*

Influence of Exportation on Agriculture.

We export annually agricultural products worth at the seaboard more than $500,000,000. At farmers' home markets, as raw material, without the expense of preparation or extension into more convenient forms for export, and without the expense of transportation or brokerage, they are worth not more than $300,000,000. It is safe to say that not more than one-tenth of our agricultural production is exported. The carriage of all that this tenth represents over thousands of miles, is a spectacle that never before was seen. No other nation approaches it. As a rule, nations export raw material sparingly; as a rule, the practice contravenes the first principles of national economy.

Surplus products of manufacture are exported by all enterprising nations. The greater the amount of labor they represent, the lighter the weight in proportion to value, the higher the degree of national prosperity arising from industry. Few nations have uniformly a surplus of food products; none deliberately adopt a policy of insufficient production and reliance upon neighboring nations for a portion of the bread supply. Such a nation would be practically in a stage of perpetual siege, and in constant danger of subjugation through famine. Great Britain is not an exception: her dependence is compulsory, and yet it might be avoided by converting her hunting preserves into grain fields and pastures. Her limited territory and population have compelled the policy of colonization, by which a large portion of the world is placed under contribution, and the fatal results of such dependence is avoided. Except in extraordinary emergencies, the failure of crops, the waste of war, or other interference with production, every nation will, as nearly as possible, provide its supply of bread and meat.

The effect of exportation on prices in this country is, of course, favorable to producers. It has prevented utter collapse of prices, in recent seasons of heavy production, as in the case of corn and hay products. It has kept the price of beef in a steady and unfaltering position during the period of shrinkage and decline in values. Yet it should be remembered that the home market is nine times as large as the foreign. Should a readjustment of industry transfer one-tenth of our agricultural labor to other branches of productive industry, the effect upon the prices would be equal to that resulting from present exportation, with the additional advantage of saving in transportation and commissions.

The present excess of food production is the result of natural causes, the immigration from Europe, the transfer of labor from temporarily suspended manufacture and mining; and, in the recent era of industrial depression, has been the means of mitigating its severity and securing a return to prosperity. During this period the value of agricultural production sent abroad has been equivalent to $300 for every family in the country. It has brought home most of the government bonds held abroad, a large amount in railroad and other indebtedness, and is now bringing millions of foreign gold.

The extent of our unoccupied fertile lands has favored the expansion of food production. Should immigration continue, as it probably will, and better seasons give larger crops to Europe, this excess may reduce prices and profits, and cause depression and discouragement among farmers. To avoid this result, local manufactures should be encouraged, and corn reduced more and more to meat and wool, grass to butter and cheese, wheat to flour, and all things to the smallest bulk and highest value. We cannot continue perpetually this increase of exports of raw products.—*J. R. Dodge, in Chicago Farmers' Review.*

Borrowed Sermons.

Within the last month, one prominent clergyman in Chicago, and another in a town in New York State, have been accused, possibly without justice, of preaching other people's sermons as their own. The increase of this offensive practice in recent years, and the indication that it supplies of the fact that many of the clergy are tempted by the severe labor of sermon-writing to do wrong, suggests that it might be a good idea to arrange a sort of sermon exchange which would enable clergymen to swap sermons openly and without disguise. All the Presbyterian ministers, for example, might pool their sermons, say once a month, and then each could draw out a month's sermons written by other men. This would give variety to the pulpit exhortations, and it would supply a fair average for the whole body of the church, for the congregations which have poor preachers would obtain some good sermons, and those with good preachers would get some poor sermons. Sir Roger de Coverly insisted that to preach an excellent borrowed discourse, with a frank avowal that it is borrowed, is far better than to preach a poor original one, and the theory is a most reasonable one.—*Leavenworth Times.*

THE eastern papers state that a Kansas farmer, taking advantage of the ready change in the flavor of butter by absorption, plants sweet clover and sweet peas under the windows of his milk room. The room is filled with their fragrance, and the butter improved. Any method to improve Kansas butter.

Sewing-Machine Patents.

The expiration, last year, of some important patents on sewing machines, was followed by an immediate reduction in the prices of most of the machines used for family sewing, or in making the uppers of boots and shoes; and since then manufacturers have been anxiously looking forward to the time when the McKay patents on the sole-sewing machine would run out. Of all the machinery at present used by shoe manufacturers, this sewer is probably the most important, as it is almost universally employed, and the tax for its use consists in a royalty averaging, probably, about two cents per pair on all goods made by it. This royalty is generally paid by affixing stamps, the price of which ranges from half a cent to ten cents per pair, the latter figures being for quilted boots and shoes, men's ordinary boots paying four cents, and shoes three cents, while women's pay two cents and children's half a cent to a cent per pair. One of the leading patents on the machine, the one known as the "horn" patent, expired last month; and we had a number of inquiries from manufacturers who supposed that they would not thereafter have to affix the royalty stamp to the shoes they made. There are, however, many other patents on the machine; and the conditions under which machines are furnished to the manufacturers provide that the royalty shall be paid until *the last patent* has expired.

We have received from the McKay Association a statement as to the form of contract they make with manufacturers, and a mention of the duration of their patents, which we append. The important patents which expire in 1881, and without infringement of which they think it will be difficult to make a successful sole-sewing machine, are,—the shoe process, the expanding joint whirl, and the variable stroke. The first of these patents is on the making of a shoe by sewing directly, from the outsoles, through the upper and insole; the expanding joint whirl added greatly to the speed of the machine; and the variable stroke made it possible to sew with facility from a thick to a thin or a thin to a thick substance, and still keep an even tension. The following is a synopsis of "the situation," as presented by the McKay Association:

"There is some interest felt among manufacturers about the royalty on the McKay sewing machine. The contracts between the Sewing Machine Association and the manufacturers are of this nature. The machines are all owned by the Association, the papers signed by all licensees clearly stating the fact. The leases require the payment of the full royalty as long as there is any patent on the machine, and that at the expiration of all the patents the lessee has the right (if he has kept the terms of the lease) to purchase the machine for $1. From this it seems that the expiration of any one or more patents on the machine is of no effect on the question of the right to use the machine without royalty; and it is only by the expiration of all the patents that that obtains."—*Shoe and Leather Reporter.*

IT is *skilled* labor for which there is greatest demand in these times. The *Scientific American* mentions that a recent advertisement for twenty-five skilled workmen brought only one application; while two others, one for a book-keeper and another for a clerk, brought 347 and 130 applications respectively.—*Topeka Capital.*

WHILE it may not be judicious for the aged and those of limited vital powers to dress and undress in cold rooms, so cold as to cause suffering, it is undesirable to sleep in a warm room, or such a room as would be comfortable during the day.

THE INDUSTRIALIST.

SATURDAY, NOVEMBER 15, 1879.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY

Fall Calves.

If the farmer has warm and comfortable stabling for his stock, he will certainly find that fall calves can be raised more cheaply and with less risk than those dropped at any other time. We took occasion to urge this idea in these columns some two years ago. Since then we have been forced, by circumstances, to raise a good many calves at other seasons; and we have become more than ever convinced that the ideas then advanced were correct. We prefer calves dropped in September to any other month, for the very good reasons that calves then escape the intense heats of summer; and during the winter season they can be "pushed" with grain, and in the spring are ready for the young grass as soon as it appears. The professional breeder likes fall calves, too, but for the additional reason that they "show" at the September fairs as "calves," when, in reality, they are only a few days short of a year old, and as "yearlings," when they are really close to two years old. It would seem that there are tricks even in the farmer's trade.—*Prof. Shelton.*

THE October number of the New York *Medical Journal* contains an article on "The Anatomical Uses of the Cat," which ought to give to that sedate and stately journal a circulation equal to Ouida's last novel. That the domestic feline has "uses" other than to shape its spinal anatomy into an exaggerated "Hogarth curve," while working its diaphragm in generous rivalry of the country brass-bands, will surprise and delight the average householder. Thomas, like the poor Indian, must "go;" and the manner of his taking off sates the vengeance of the most irascible. This "prolific, cheap and easily obtainable animal" is to be given over to the tender mercies of the youthful Sawbones for dissection, "as the best possible introduction to the study of human anatomy, with which its own is peculiarly allied." Never more will the seductive voice of the convivial feline woo the attic lodger from his couch and dreams; and no more will that same lodger clutch the deadly soap-dish, and sally forth at "midnight's holy hour" only to meet the swiftly-moving clothes-line. No more will our back-yards and fences be furrowed and scarred by such deadly missiles as chamber crockery and boot-jacks. Hereafter, back-fences and the roofs of outbuildings will be tenantless and consequently useless; and it may be expected that no more of these will ever be constructed.—*Prof. Shelton.*

Commissioner Le Duc.

"Old Federal farmer," "crazy apostle of American sugars," "ignoramus," "inefficient," "political dead-beat,"—these are some of the epithets with which certain editors have seen fit to dub our Commissioner of Agriculture. But this man, so derided, held up for contempt, and made the butt of supposed-to-be witticisms and sarcasm from every side, has gone quietly on; and now, after two years of martyrdom, he is even proud of the title of "apostle of American sugars," whatever may be the prefix.—*Land and Home.*

We are decidedly of the opinion that Mr. Le Duc is the worst-abused man in America. Personally, we do not know the Commissioner of Agriculture, and we have never been the recipient of unlimited quantities of seeds; but we do know something of what he has attempted and done, and the opposition that he has encountered from the start; and we have no hesitation in saying that Mr. Le Duc has already done more for American agriculture than all the other commissioners taken together, and not excluding the venerable "Sir" Isaac Newton himself. He has made mistakes; but then the only persons who do not mistake are those who do nothing. At this time it may be said that the National Department of Agriculture does not exist for the sole purpose of distributing political lollipop, in the shape of cheap seeds; but is taking a leading part in all the prominent movements for the benefit of farmers. Commissioner Le Duc has doubtless found out by this that everybody knows just what the "Department" ought to do, and how to do it; and men who could not farm a village lot successfully consider themselves quite competent to criticise the Agricultural Department.—*Prof. Shelton.*

Meeting of the Kansas Academy of Science.

The Kansas Academy of Science held its twelfth annual meeting, in Topeka, on the 6th and 7th insts. The business meeting, on the afternoon of the 6th, was held in Dr. A. H. Thompson's office. The other meetings were held in the Senate Chamber. Although the list of papers to be read was not so lengthy as that of last year, it was quite attractive.

A paper on "Recent Additions to Kansas Flora" stated that one hundred and twenty new species had been added this year, giving twelve hundred and seventy as the whole number of species of Kansas plants that are known. The new additions include sassafras, flowering dogwood, red birch, huckleberry, white water-lily, and various other smaller but interesting plants.

"The Metamorphic Deposits of Woodson County" was the subject of another paper. The metamorphic action extends over a small area. It was the result of thermal springs, evidently, and not of igneous ejections. Fine specimens of amethyst were found, the first obtained in Kansas. None of the precious metals have been found, notwithstanding the industrious and expensive search that has been made.

Judge Adams, of Topeka, presented a very interesting paper on "Phonetic Representations of Indian Language." In this paper, and also in one on "Elementary Sounds of Language," a strong plea was made for the phonetic system in our own written language.

A paper on New Mexico was read to the interested audience. Some speculations in this paper regarding an increase in the rainfall, called forth considerable discussion. This resulted in the conclusion that we have not sufficient data to establish the truth of the alleged increase; and, hence, that theories explaining it are entirely gratuitous.

Indian graves near Topeka, and relics obtained from them, furnished the substance of a paper by Dr. A. H. Thompson. The graves were placed with the head to the east and the feet to the west. The accuracy with which they were arranged in this position would indicate some knowledge of the cardinal points; but the rising and the setting of the sun may have been the guide.

Prof. B. F. Mudge, of Manhattan, presented an article on "Mound Builders in Davis and Riley Counties, Kansas." A description was given of a mound recently opened near Junction City. Fragments of pottery were quite abundant; beads, also, were abundant. Some of these were made of shells; others were the sections of the stems of crinoids. This is the only known mound so far west in the State, and, hence, is of peculiar interest. Fragments of pottery, bearing the characteristic grass marks, are frequently found; but they are probably left upon sites of summer camps, rather than those of permanent residence.

In addition to the above paper, Prof. Mudge gave a popular lecture on the general topic of "The Mound Builders," to a crowded room of attentive listeners. Their mounds are very abundant in the middle States; are of various sizes and shapes, but always have some regular form, showing that they had some knowledge of mathematical figures. The great solicitude shown in caring for the dead shows a comparatively high degree of civilization. The pipes found in their burial mounds indicate that they were acquainted with the use of tobacco. The speaker displayed a vase found in the city of Manhattan, about fifteen feet below the surface. It was very perfect in form, but had been broken by the workman's pick in taking it out. The only places where mounds have been discovered in this State are near Junction City and Leavenworth. An earnest appeal was made for retaining within the State all specimens and relics, and especially those giving light upon the civilization attained by the aborigines.

A committee was appointed to locate and describe the coal deposits of the State. A few other papers of some local interest were presented. F.

Stock-Raising the Remedy.

The Duke of Beaufort is credited with saying, in a recent speech, that it was useless for the English farmer to attempt to compete with American grain-growers, in the production of the great cereals; but that, in the production of animal products of the best sort, the English farmer as yet had sustained no serious rivalry. His Grace goes on, we are told, and advises the farmers, as a remedy for the prevailing hard times in England, to cultivate stock-raising, and the production of dairy products, meat and wool, which may be profitably done even in face of the existing high rents.

In all this, history but repeats itself; for, if we examine the recent history of English and American agriculture, we shall see that the remedy for every depression of the agricultural interest, and the one that has never been applied in vain, is the one proposed by the Duke of Beaufort. A striking illustration of this was furnished a few years after the passage of the "Corn Laws," in 1846. Then, as now, the English farmers were threatened with the wholesale competition of America, the Black Sea countries, and others having abundant and cheap lands; and they were forced to abandon, in a measure, wheat-growing, and to turn their attention to stock-raising.

This revolution in British agriculture resulted, not alone in an increased production of animal products, but also in a vast increase both in the average yield and total product of wheat itself. Very soon the average yield of wheat, in England, rose from about twenty bushels per acre to twenty-eight; and that, too, in spite of the fact, as stated by anable writer, that "wheat, prior to this time, was only grown on the best lands, whereas it is now grown indifferently upon all sorts." The explanation of this is to be found in the fact that the increased attention to live stock compelled better farming, by making more manure, which gave richer land and larger crops of wheat. Whether the same success will attend a second experiment remains to be seen; but that increased attention to stock-raising will improve the English farmer's condition, we have no doubt.

We do not remember, in any of our reading, to have seen a case where disaster, growing out of natural causes, had overtaken an agricultural community whose support came chiefly from stock-raising, in some of its branches. Drouth, grasshoppers and hailstorms visit nearly all communities alike; but it is from the exclusive grain-growing regions that the loudest cries proceed, after one of these visitations.—*Prof. Shelton.*

THE INDUSTRIALIST.

SATURDAY, NOVEMBER 15, 1879.

Instead of the usual circular or catalogue, we send the Industrialist to those desiring information about the Kansas State Agricultural College. We would call attention to the articles headed "Departments of Instruction," "Industrial Education," "Special Advantages," and "Directions to Applicants." If further information is desired, address Agricultural College, Manhattan, Kansas.

The gentleman who said that this would be a dry fall, is entitled to the floor.

The next term of the Agricultural College will commence Friday, January 2d, 1880.

The receipt of a handsome photograph of the celebrated herd of North Devon cattle, belonging to Gen. L. F. Ross, Avon, Ill., should have been acknowledged some time ago.

Our grasses, and especially orchard-grass, have made a vigorous growth during the past two weeks. Our meadows furnish superior pasturage, even on this 15th day of November.

It is vaguely rumored that what George Martin somewhat technically calls a "hoo-doo," is one of the things to come off on the Hill in the near future. Have you heard anything about it?

On Wednesday a long sack, containing just two hundred pounds of wheat, was carefully buried in a bin of wheat in the barn. The point is, how much will this wheat shrink during the next six months?

Let's see, on Thursday night the meteors were to have been out on a frolic! How did it happen that on that particular night everybody "slept a little sounder" than during any previous night of the season?

We have had occasional glimpses of the pleasant face of Mrs. Anderson about the grounds this week, as she was packing up the Lares and Penates of the presidential mansion. We witness the departure of these old friends with sincere regret.

Several more new students have been enrolled since our last report. Among them are: Preston Neiswender, Chalk Mound, Wabaunsee county; Jennie S. Platt and J. T. Willard, Wabaunsee, Wabaunsee county; Noah L. Bowman, Sugar Valley, Anderson county; and Wm. E. Miller, Onaga, Pottawatomie county.

This week we resume the publication of the weekly meteorological record at this station. Additional appliances in the Chemical Department enable us to give full and reliable reports of the weather; and we publish them, not as an item of current news merely, but because they will be valuable in the future for reference.

The display of well roosters and sick roosters, and roosters in the agonies of vomition, seen in most of our exchanges, makes them look like poultry journals with exaggerated veterinary departments. The fellow who is generally seen walking off with a long face, is evidently the doctor in charge, who has taken by mistake a dose of his own medicine.

We noticed yesterday in Manhattan, for the first time, a number of those broad-headed, restless, voracious, noisy little brutes called English sparrows. This ought to be worth something to the College debating societies, who, we modestly suggest, when they get through discussing the "jury" system, Elizabeth and Mary, German *vs.* American patriotism, and other subjects of which they know nothing, might, to advantage, inquire into the usefulness of the English sparrow.

Educational meetings, consisting of a State Normal Institute, a Convention of County Superintendents, and an Examination of Candidates for State Certificates and Diplomas, will be held in Topeka, during the entire week, commencing the 29th day of next December. The programme of these meetings will be prepared with direct reference to the institute work of the coming summer; and persons proposing to serve as teachers of institute classes will find it specially to their interest to attend.

Despite mud and rain, a few Websters gathered in the new Society Hall last Saturday evening; and, there being a quorum present, the Society was called to order by the Vice-President. As some of the debaters were absent, that order was passed until next meeting. Under the head of extemporaneous speaking, the Indian subject was discussed. If the fate of the "poor red man of the forest" was left to the majority of the members then present, he would undoubtedly fare pretty rough. Our first numbers of the *Popular Science Monthly* and the New York *World* have arrived. Everybody come out next Saturday evening and see our vain endeavor to make our thunder echo.

CÆSAR.

It will be seen, by reference to the meteorological report, that the rain-fall for the week just closed is 7.19 inches. The greatest November rain-fall for twenty years previous is 2.33 inches. The precipitation this week is more than three times as great as the maximum for the month, previously. In one case only have we recorded an equal precipitation in one week, and in no case the same amount in a period of four days. The great rain-fall to which reference is made above was 8.82 inches, in July, 1878.

To the casual observer, seven inches of water may not seem such an enormous amount; but a very simple calculation will dispel such notion. During this storm 1,628,000 pounds of water fell upon each acre of surface, which would be 260,480,000 pounds, or 130,000 tons, to the quarter section. When one considers the vast territory over which such a general rain extends, a true conception is had of the quantity of water precipitated.

Notwithstanding the meteoric shower which didn't occur Thursday night, a goodly number of Alpha Betas gathered Friday afternoon, determined to carry on the good work done in the Society. The officers-elect, after passing a rigid examination, took their seats. The valedictory of the ex-President was followed by an inaugural from the new President. It was an earnest appeal to the Society to keep on in the work here in progress with the same spirit manifested during the past term.

The debate and music which followed was listened to with interest. Wm. Whaley's declamation brought vividly before our minds the stirring scenes of the Revolution. Extemporaneous speaking, as usual, was purely Alpha Betical, both in character and style. The *Gleaner* will be presented next week by Ed Coleman and Miss Lizzie Cox. Propositions for membership: John and Albert Copley, I. D. Gardner, Mr. Gish, and Miss May Quinby.

GEORGE.

ENTERPRISE ITEMS.

The outlook for 1880 is a very gloomy one for the children. Washington's birthday, 4th of July, and Christmas all come on Sunday.

Justice Snow's room, formerly occupied by S. M. Fox, as a book store, has been leased to parties who will fill it with dry goods exclusively.

Arrangements are fast being completed; and the musical convention to be held here during the second week in December is an assured success.

John Drew is organizing a stock company, for the purpose of importing a thoroughbred Norman horse. It is expected to be the best horse that ever entered Kansas.

J. D. Haskins, agent for the Michigan & Chicago lumber is here, and will open up their lumber-yard at the old Brown stand, on Poyntz Ave., the last of this month.

Wm. W. Enterline, on Monday last, in the woods across the Kansas, shot a bald-headed eagle that measured from tip to tip 7 feet and 3 inches, weighing 12½ pounds. It was stuffed by Dr. Blachly.

NATIONALIST ITEMS.

Mr. Young is selling a car load of lumber per day. The other lumber-yards are also doing a good business.

L. N. Houston, formerly a College student, is now the K. P. Railroad agent and operator at Lawrenceburg.

One car of machinery for the new grist and flouring mill arrived this week. About eight more car loads are expected; and Mr. Keiser says that, after commencing to set it up, it will take about a month to finish.

The Manhattan Cornet Band is making arrangements for a grand concert, to be given in about two weeks. It will continue two nights; and the band will be assisted by the best musical talent the town affords.

From the Riley Center *Independent*, we learn that on Saturday night, as Mr. George Gale was driving near Milford, his horses became frightened, shied, and overturned the carriage. Mrs. Gale was so badly hurt about the head that she was insensible for some time, and not able to be taken home until the next Monday.

DIRECTIONS TO APPLICANTS.

TERMS OF ADMISSION.

Candidates for admission must be fourteen years of age, and pass a satisfactory examination in reading; arithmetic, through decimal fractions; and English grammar, to syntax. Classes are started at the beginning of each year in Drill in Arithmetic and Drill in English; and the pupil must have the knowledge above indicated, else he will be unable to retain position if admitted.

Pupils will be received at any time during the year, if able to pass an additional examination upon the subjects studied by the classes which they expect to enter. But they will find it greatly to their advantage to be present at the opening of each term, or as soon thereafter as posssble.

GRADES.

Both the Literary and Industrial recitations are graded daily upon a scale of 100; and an examination of all classes is made at the close of each month. A student not attaining an average grade of sixty is promptly dropped to a lower class, or excluded from the Institution until able to do so. The work of grading is strict and uniform in all the departments, and this process is rigorously used for sifting out incompetent and indolent pupils; thus more than accomplishing all that is designed to be effected by a "high standard of admission." Hence, the student's continuance in the College wholly depends upon his own action.

The course is based upon the determination to make the labor required in the preparation of one industrial and three literary recitations as much as the average student can perfectly perform, in ten hours a day. We design to give the pupil the worth of the time expended at College; and, in order thereto, he must do a full day's work with brain or hand. Only those students who can maintain a standing of ninety in each study will be allowed to take more than the prescribed number of recitations; and no one will be permitted to have less than one industrial and three literary recitations.

RELIGIOUS.

Unless otherwise directed by parents, students are required to attend chapel at 8:30 A. M. on academic days, and divine service once every Sabbath.

EXPENSES.

There are no charges whatever for enrollment, attendance or instruction in the regular courses; nor are there any "contingent fees" for the repair of buildings, for the use of books or apparatus, for diplomas, or the kindred privileges usually grouped under the term "contingent." Male students are furnished instruction, the use of apparatus, instruments or tools, in both the literary and industrial classes marked out for them, without any charge. And the same is true of female students in the regular classes provided for them. Printing and Telegraphy are industrials primarily provided for the education of female students, and male students taking either of these are charged $1 per month for use of instruments.

Instrumental music is a fine art or "accomplishment," rather than a mechanical art. We do not place it among our "industrials" in the same sense, or for the same purpose, that we do those provided for teaching the trades. Accordingly, the following fee is required from female students for tuition and the use of instruments:

Terms per week:

Private lessons, 2 a week, on any instrument, $1.00
Private lessons, 1 a week, on any instrument, .60
Class lessons, 2 a week, on any instrument, .65

Instruction in harmony, etc., etc., from ten to fifty cents per week, as the student may or may not be in other classes.

The only charge made for material in either the literary or industrial departments is for the chemicals used by students in laboratory practice, which are furnished at wholesale prices, and amount to but a small sum.

Furnishing an absolutely free education is as much as can be reasonably asked; and the Institution neither boards, clothes, nor supplies the student with text-books. Boarding can be obtained in private families at from $2.75 to $4 per week. Washing costs from seventy-five cents to one dollar per dozen. Text-books, which can be procured in Manhattan, cost from $2 to $5 per term.

No student need expend over $5 per week; and many of our best pupils are living at $1.25 per week. Students desiring to "board themselves" can do so at from $1 to $2 per week. In a club of four young men, renting a house, the average cost to each for the term was $1.11 per week.

LABOR.

Manual labor by the students may be for either of two purposes: First, to acquire skill in a given art; second, to earn money. In the first case, the labor is educational; in the second, it should be paid for by the party benefited.

Educational Labor.—Manual labor in the recitations of the Industrial Departments, like mental labor in those of the Literary Departments, is purely educational and will not be remunerated. While the interest of the student will be held paramount in the direction of this labor, the practice necessary to dexterity will be required.

Remunerated Labor.—When the Institution needs labor on the Farm or elsewhere which is not educational, but simply for its own profit, and which a student is able and willing to perform, it becomes an employer instead of a teacher, and he an employe instead of a scholar. It pays for work, he works for pay. The relation between them is commercial, not educational; and both parties must act upon business principles. Hence, the College furnishes only such employment as its own interests require, and will pay according to the value of the service rendered at from seven to ten cents an hour.

AMOUNT EARNED.

It is impossible to predict how much a given person can earn, since that depends upon what he can do and what work there is to be done. Hence, it is wholly impossible for us to answer the question so often asked: "Do you think I can meet my expenses by work?" Some students make one-half their expenses, some the whole, and exceptional men have made more than expenses. As a rule, a faithful boy skilled in farm work can earn half his expenses on the Farm or in the Nursery. During the year he can ordinarily acquire sufficient skill in the wood or iron shops to enable him to make articles for sale. The whole question is one for his own consideration and decision. We can teach all who come, but cannot absolutely *promise* anything more. Hitherto we have refrained from holding out strong inducements respecting the amount of labor we might have to offer; but in view of the fact that during each of the last three years we have had more to do than the students could perform, we are inclined to give greater and positive encouragement on this point. Any boy who is in dead earnest, who is familiar with farm operations, and who can raise $50 to start with, should be able to carry himself through the four years' course. And certainly this places an education within the reach of every determined boy. As yet we are unable to offer similar advantages to girls, not requiring labor in the College departments which they can perform.

RULES.

1. Behave as a true man or woman should, at all times and in all places.

2. Attend to your own business promptly, thoroughly and courteously; and vigorously let alone that of other people.

3. Penalty: "Leave!"

PUBLICATIONS.

THE INDUSTRIALIST, a weekly journal edited by the Faculty and published by the Printing Department, contains original and seasonable articles on the Farm, Orchard, Trades, Sciences, and Education. Price, 75 cents a year. Address A. A. Stewart, Manhattan.

CALENDAR.

Fall Term, 1879.—Began Wednesday, September 10th, 1879, and will close December 18th, 1879. Next term will begin January 2d, 1880.

TO NEW STUDENTS.

Bring the text-books you have been using. On arrival, first arrange for your boarding. A. A. Stewart will furnish information, either by letter or on application, concerning boarding places or rooms for rent. Report to the President at 8:30 A. M., immediately after chapel exercises, for enrollment.

For further information apply to M. L. Ward, President *pro tem*, Manhattan, Kansas.

LITERARY SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in the College Chapel every Friday at 2 P. M. Ladies admitted. New students cordially invited to attend. GUS H. PLATT, President.
MISS DORA KINSEY, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Telegraph Hall every Saturday evening. Visitors, especially students, always welcome.
D. S. LEACH, President.
MARK A. REEVE, Secretary.

RAILROAD TIME-TABLE.

KANSAS PACIFIC RAILWAY.

PASSENGER ARRIVES.

No. 2, going East	11:58 A. M.
No. 4, going East	3:28 A. M.
No. 1, going West	4:03 P. M.
No. 3, going West	4:51 A. M.
No. 7 (freight), going West	8:45 A. M.

Nos. 1, 2 and 7 run daily. No. 3 runs daily except Monday. No. 4 runs daily except Sunday. Passengers with tickets are carried on No. 7.

GEO. C. WILDER, Agent.

METEOROLOGICAL RECORD.

Condensed, by Prof. Failyer, from the observations taken at the State Agricultural College, for the week ending November 13th, 1879. Latitude, 36°12′; Longitude, 96°40′; Height, 1,200 feet.

DAY OF WEEK AND MONTH.		Relative Humidity.	Temperature. Max.	Min.	Mean.	Bar. Mean Hight.	Inches of Rainfal.
Friday	7	80	68°	52°	57°.2	28.28	
Saturday	8	78	49	39	44	28.29	2.31
Sunday	9	67	52	30	43 .8	28.63	
Monday	10	88	68	44	61	28.44	
Tuesday	11	98	59	55	57 .7	28.31	4.79
Wednesday	12	85	58	45	49 .3	28.30	.09
Thursday	13	79	56	45	51 .2	28.43	

Average temperature for the week, 52°.
Range of temperature for the week, 38°.
Rain-fall for the week, 7.19 inches.

THE INDUSTRIALIST.

SATURDAY, NOVEMBER 15, 1879.

Industrial Education.

The real value of an education to the student depends upon two things: First, the practical worth of the knowledge taught; and, second, the degree in which he makes it his own. Hence, the ability of any institution to give a practical education depends upon the kind and aim of the knowledge it teaches, and upon the thoroughness of the instruction therein. The State Agricultural College was directly endowed by Congress, and is guided by the State, for the specific purpose of furnishing to the industrial classes of Kansas a "practical" education, that is, "one fit for use." As its name indicates, and as the statistics of the industries of the State require, its chief work must be that of giving a useful and usable education to those who will engage in farming; and, therefore, the Farmer's Course must, from the nature of the case, be its main one.

FARMER'S EDUCATION.

Words and figures are merely instruments with which to record ideas. They are not themselves ideas, nor should they be made the chief end of an education. As a wagon is necessary to haul grain, so are they a necessary part of an education; but as the wagon is not the grain, so they are not the knowledge which the farmer converts into money. Hence, the classics and higher mathematics are not taught. But it will be noticed in the following course that so soon as the pupil acquires working skill in the use of the English language as a tool, and of figures and lines as mathematical tools, those arts and sciences which present knowledge that has a cash value to the farmer are taught as rapidly as their importance and thorough acquisition will permit. Studies numbered (1) and (4) in the second, third and fourth years are the spine of the course, to which the others are as ribs and muscle.

FARMER'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
6. Logic.	1. Practical Agriculture (advanced.)	1. Botany, Entomology.	1. Physiology.	1. Physiology.	1. Drill in English.	1. Drill in English.	1. Drill in English.
5. Agricul. Chemistry	2. Geology, Mineralogy.	2. Inorganic Chemistry.	2. Rhetoric.	2. Rhetoric.	2. Drill in Arithmetic.	2. Drill in Arithmetic.	2. Drill in Arithmetic.
4. Zoology.	3. Polit. Economy, Practical Law.	3. Practical Geometry.	3. Algebra.	3. Algebra.	3. Industrial Drawing.	3. Industrial Drawing.	3. Industrial Drawing.
3. Polit. Economy	4. Zoology.	4. Horticul., Landscape Gardening.	4. Practical Agricul. (elementary).	4. Practical Agricul. (elementary).	4. English Structure.	4. English Structure.	4. English Structure.
2. Geology, Mineralogy.	5. Organic, Analytical Chemistry.	5. Organic, Household Chemistry.	5. Physics.	5. Physics.	5. Adv'd Arithmetic, Book-keeping.	5. Adv'd Arithmetic, Book-keeping.	5. Adv'd Arithmetic, Book-keeping.
1. Farm Economy, Special Hygiene.	6. Practical Surveying.	6. Household Economy.	6. Industrial Drawing.	6. Industrial Drawing.	6. U.S. History, Industrial Drawing.	6. U.S. History, Industrial Drawing.	6. U.S. History, Industrial Drawing.

WOMAN'S EDUCATION.

Nearly one-half of our students are females, and the Woman's Course is prepared expressly for their liberal and practical education. We have no doubt whatever that practical men and women, who understand what it means and what it seeks to do, will fully endorse it.

WOMAN'S COURSE.

FOURTH YE'R		THIRD YE'R.		SEC'ND YE'R		FIRST YEAR.	
Spring.	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*	*Spring.*	*Fall.*
6. Logic.	1. Farm Economy, Special Hygiene.	1. Botany, Entomology.	1. Physiology.	1. Physiology.	1. Drill in English.	1. Drill in English.	1. Drill in English.
5. Phys'c'l Geography, Meteorology.	2. Geology, Mineralogy.	2. Inorganic Chemistry.	2. Rhetoric.	2. Rhetoric.	2. Drill in Arithmetic.	2. Drill in Arithmetic.	2. Drill in Arithmetic.
4. Zoology.	3. Polit'l Economy, Practical Law.	3. Industrial Drawing.	3. Algebra.	3. Algebra.	3. Industrial Drawing.	3. Industrial Drawing.	3. Industrial Drawing.
3. Polit'l Economy	4. Zoology.	4. Horticul., Landscape Gardening.	4. English Literature.	4. English Literature.	4. English Structure.	4. English Structure.	4. English Structure.
2. Geology, Mineralogy.	5. Organic, Household Chemistry.	5. Organic, Household Chemistry.	5. Physics.	5. Physics.	5. Adv'd Arith., Book-keeping.	5. Adv'd Arith., Book-keeping.	5. Adv'd Arith., Book-keeping.
1. Farm Economy, Special Hygiene.	6. Household Economy.	6. Household Economy.	6. Industrial Drawing.	6. Industrial Drawing.	6. U.S. History, Industrial Drawing.	6. U.S. History, Industrial Drawing.	6. U.S. History, Industrial Drawing.

MECHANIC'S EDUCATION.

Because of the adaptedness of the leading course to the wants of the intelligent mechanic, it has been found practically unnecessary to diverge from the Farmer's Course. Additional studies, specially adapted to the mechanic's use, will be furnished in a Post-Graduate's Course.

If it be urged that the distinctively agricultural knowledge taught in the Farmer's Course is not directly valuable to the mechanic, we reply that, admitting the point for the purpose of argument, yet: 1. This knowledge is of more practical value to the mechanic than is the Latin, Greek, or a half dozen other things embraced in the usual course preparatory to the professions; 2. That the great majority of Kansas mechanics will also be more or less engaged in agriculture; 3. That those studies in the course which are directly valuable to the mechanic, together with the shop facilities, offer a better mechanic's education than can be elsewhere found west of the Alleghanies.

INDUSTRIAL DEPARTMENTS.

Having knowledge in the head is one thing; ability to use it with the tongue, fingers or feet is quite another thing. Both are vital to success in practical life. A man might thoroughly understand the theoretical principles of carpentry, and yet, not having used the tools, be wholly unable to earn carpenter's wages. So in all other vocations. Accordingly, instruction is given in the following well-equipped Industrial Departments, and every student is required to recite in some one of them, as selected by the pupil or parent:

FOR MALE STUDENTS.	FOR FEMALE STUDENTS.
The Farm.	Dress-making.
The Nursery.	Printing.
Carpentry.	Telegraphy.
Cabinet-making.	Scroll-sawing.
Turning.	Carving.
Wagon-making.	Engraving.
Painting.	Photography.
Blacksmithing.	Instrumental Music.

Each of these departments is conducted exactly as in daily life, and aims to give precisely the drill received by an apprentice. No charge is made, either for tuition or material, from male students taking the Industrials provided for them; nor from female students taking the ones provided for them, except in Instrumental Music. Male students taking either Printing or Telegraphy are charged $1.00 per month for the use of instruments and material.

DEPARTMENTS OF INSTRUCTION.

DEPARTMENT OF AGRICULTURE.

PRACTICAL AGRICULTURE.

Second Year:—General principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage.

Fourth Year: General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of a rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farmhouses; barns.

FARM ECONOMY.

Woman's Course, Fourth Year: Dairy products as human food; influences affecting character of milk; manufacture of condensed milk; the factory system and household plan of cheese-making; treatment of rennet; general process of cheese manufacture; subsequent treatment of cheese; butter-making; creameries; "deep" and "shallow" setting systems; general process of butter-making; packing and preserving butter.

DEPARTMENT OF BOTANY AND PRACTICAL HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest; also a course of lectures on Landscape Gardening. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard; fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture; shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in in the work of laying out and plotting grounds topographically.

CHEMICAL DEPARTMENT.

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life. Text-book, Ganot.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blowpipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

Are constantly in progress in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

DRILL IN ENGLISH.

"As grammar was made after language, so ought it to be taught after language."—*Herbert Spencer.*

Drill in English embraces the following topics:

Sounds of the language; drill in producing the vocal, sub-vocal and aspirate elements with accuracy, distinctness and volume; vowels, consonants.

Letters: Form; power; rules for spelling, drill.

Words: Signification, properties, modifications, variations, relation and dependence.

Sentences: Drill in statement of ideas; description, clearness, terseness, vigor; business letters, discussion; capitalization; syllabication; punctuation; construction and analysis of sentences; elements, uses and names; criticism of compositions printed as written; proof reading; grammatical construction; superfluous words and clauses; drill in reading, speaking and penmanship.

Text-books: Webster's Academic Dictionary; Lee & Hadley's Advanced Lessons in Language.

Pupils deficient in spelling, etc., should enter the printing class, the printing-office being the work-shop of language.

STRUCTURE OF ENGLISH.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

MATHEMATICAL DEPARTMENT.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

DRILL IN ARITHMETIC.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Following this line, the student, so far from hammering away at "pure" science draws from the mathematical store-house what he needs, and sees why he needs it. Accuracy of calculation and posting, rather than a *mere* comprehension of the principles, is aimed at. Besides the recitation-room drill in business forms, practice in the field is also given. Estimating the number of cords in a pile of wood said to be 100x4x4 feet is one thing; measuring a pile of wood through which any number of cats may be harmlessly thrown, and in which four-feet sticks are the exception, is quite another and more difficult thing.

ARITHMETIC AND BOOK-KEEPING

Is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides ensuring arithmetical practice, develops practical skill in that important art.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admiral system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study. In addition, constant practice in the application of lines to metal and wood is furnished in the Blacksmith, Carpenter, Turning, Scroll-sawing, Carving, Engraving and Printing shops, and to fabrics in the Sewing Department.

PRACTICAL GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the use of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

PRACTICAL SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

STUDIES SPECIAL TO WOMAN.

Besides the studies already indicated, attention is called to the following:

SPECIAL HYGIENE.

As shown in the course, one term is devoted to the study of Physiology, from the text-book of Dr. J. C. Dalton. This is followed in the fourth year by a course of lectures to young ladies by Mrs. Cripps on the subject of Hygiene, embracing such instruction in hygienic matters as are valuable to woman.

FARM ECONOMY considers those affairs of the farm which usually come under the supervision of the farmer's wife or daughter, and which are not included in "gardening" or "household economy;" such as butter and cheese-making, dairy management, etc. A course of lectures is delivered by the Professor of Practical Agriculture. See heading, "Farm Economy."

GARDENING is included in Practical Horticulture. See heading, "Landscape Gardening."

HOUSEHOLD CHEMISTRY. See heading, "Household Chemistry."

HOUSEHOLD ECONOMY

Follows Household Chemistry and consists of lectures by Mrs. Cripps on the art of house-keeping, embracing cookery, domestic management, and kindred topics. Many elderly gentlemen sufficiently know, and more young gentlemen will duly discover, that systematic knowledge of how cooking ought to be done is luminously different from the ability to do it. Instruction without practice can effect but little. Accordingly, a kitchen laboratory has been completely furnished, and affords every facility for drill in the art of cooking. This drill chiefly differs from that of a kitchen in the respect that after a girl has learned to wash dishes or pare potatoes she is not kept everlastingly at either. After full trial, we have found it just as feasible to give this practice, with profit and pleasure to the pupil, as it is to give laboratory practice in chemistry,—and no more expensive.

Printing!—Daily instruction and drill in the work of a First-Class Printer. The Literary Departments offer a thorough education in the construction and use of the English Language, as employed by the Proof-Reader; in Book-Keeping; and in Industrial Drawing, as the best developer of that taste necessarily exercised by every good Job Printer. The Printing Department is well furnished with all the facilities for a speedy mastery of the art of Printing, and is in charge of a practical printer. Besides regular class instruction in printing, the weekly publication of the INDUSTRIALIST by the Department furnishes advanced students the requisite drill in newspaper work.